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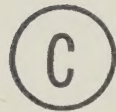




THE UNIVERSITY OF ALBERTA

UNIT COST ANALYSIS OF THE IMPLEMENTARY EXPENDITURES  
IN AN URBAN SCHOOL SYSTEM

BY



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A THESIS

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## ABSTRACT

The purpose of this study was to conduct a cost analysis of the expenditures, both current and capital, of an urban school system. The current operating expenditures for the 1969-70 school year, with particular emphasis on implementary expenditures, were analyzed and allocated to standard expenditure accounts (Reason and White, 1966) and to functional categories developed for this study. The capital expenditures for the calendar year 1968 and 1969 were analyzed and allocated to categories developed for this study. Both current and capital expenditures used per-pupil units of various kinds as a unit cost.

A total of nearly sixty million dollars (\$59,076,488) in current operating expenditures, and a total of nearly fifteen million dollars (\$14,435,017) in capital expenditures, were analyzed. Nearly two-thirds (66.2%) of the current operating expenditures consisted of instructional costs, which amounted to \$39,098,987 or \$537.19 per system pupil. Physical plant current expenditures accounted for 24.6% of the total, amounting to \$14,557,911, or \$200.01 per system pupil. The remaining 9.2% consisted of support services, amounting to \$5,419,590, or \$74.47 per system pupil, as detailed in Figure 8 of Chapter VI.

The section on capital costs points out the inequities and distortions which can arise from the use of square feet of building space as the criterion for allocation of public funds.





## ACKNOWLEDGEMENTS

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## CHAPTER I

### STATEMENT OF THE PROBLEM

#### AND ITS SIGNIFICANCE

#### I. INTRODUCTION

Concern about the problem of limited resources for public education appears to be widespread. Writers are saying the problem has become critical, and public pressures have been mounting to find solutions (Saunders, 1971:6). For example, many property owners claim their tax burden for education is too great (Canadian Federation of Mayors and Municipalities, 1967:2), and advocate more contributions to education from the province's general revenues, and/or more federal involvement in education finance (Hanson, 1969:19), as possible answers. Others, of course, simply say too much is being spent on education and economy measures must be instituted, or that our entire educational system is due for an agonizing re-examination (Wolfe, 1971:8).

The former Minister of Education for Alberta, Robert C. Clark, felt the problem of resources for public education called for analysis of present expenditures, and accordingly he commissioned a number of studies, one of which provided the frame of reference for this study. The studies carried out across the province were related to the work of the Minister's Committee on School Finance, having been sparked by a recommendation of that Committee.

Dr. P.J. Atherton, Educational Administration Professor at The University of Alberta, who was appointed co-ordinator for the provincial





series of studies, said that the broad field in which they were to be based was that of "program analysis and budgeting"; that the studies were to be "undertaken in selected typical jurisdictions," and that they would include activities such as:

- (a) Identifying and defining programs currently in existence in typical jurisdictions.
- (b) Identifying the financial, human and material resources allocated to the achievement of these programs.
- (c) Establishing the costs of programs in various types of school organization and determining the optimum conditions for economical administration.
- (d) Developing forms and procedures for the processing of data to introduce program budgeting.
- (e) Undertaking the training of selected personnel from local jurisdictions to administer program budgeting procedures.
- (f) Establishing a pilot project in program analysis and budgeting.
- (g) Recommending procedures for the institution of program analyses and budgeting throughout the total provincial school system.

One of the series, Duke's (1970) urban study, while primarily a cost analysis, engaged in most of the activities outlined in items (a), (b), (c) and (d) above. This study, which formed a part of the Duke study, addressed itself to item (a) and the financial aspects of item (b). That is, this study cost analyzed the financial resources allocated to implementary expenditures in an urban public school system.

This study was carried out during the 1969-70 school year -- September 1, 1969 to August 31, 1970. It was investigatory, descriptive, and partially analytical. The examination of the accounting system and the determination of allocated expenditures comprised the investigatory aspect; performance measures in the form of unit (per pupil) costs provided the descriptive aspect; the computations utilized comprised the





analytical aspect.

## II. THE PROBLEM

The major purpose of the urban project was to conduct a comprehensive cost analysis of selected schools in an urban school system. Figure 1a shows the total educational costs as comprising two broad categories: instructional costs and implementary costs. Instructional costs are subdivided into direct instructional costs, e.g., teachers' salaries, and indirect instructional costs, e.g., supplies and textbooks for given courses or subjects. These instructional costs were dealt with in the main by the other researchers.

This study, as part of the urban project, was confined chiefly to identifying and determining the implementary costs, which are detailed in Figures 1b and 1c. These implementary costs are divided into general implementary costs and physical plant implementary costs (Evans, 1954:42). The general implementary costs consist of support services and administration, the support services including instructional implementary costs, special education, audio-visual and library services, pupil personnel, and pupil transportation. The physical plant implementary costs consist of maintenance and repairs, operation, debt service, and capital out of current revenue.

Using the distinction in Duke's study (1970:8), indirect instructional costs and implementary costs were separated on this basis: "Indirect costs are eliminated when a subject or (instructional) program is eliminated; implementary costs are not." The vehicle used for arriving at these costs was Reason and White's Classification of Expenditure Accounts (Reason & White, 1966). This classification system was chosen for two reasons: (1) it provided a standard for the studies



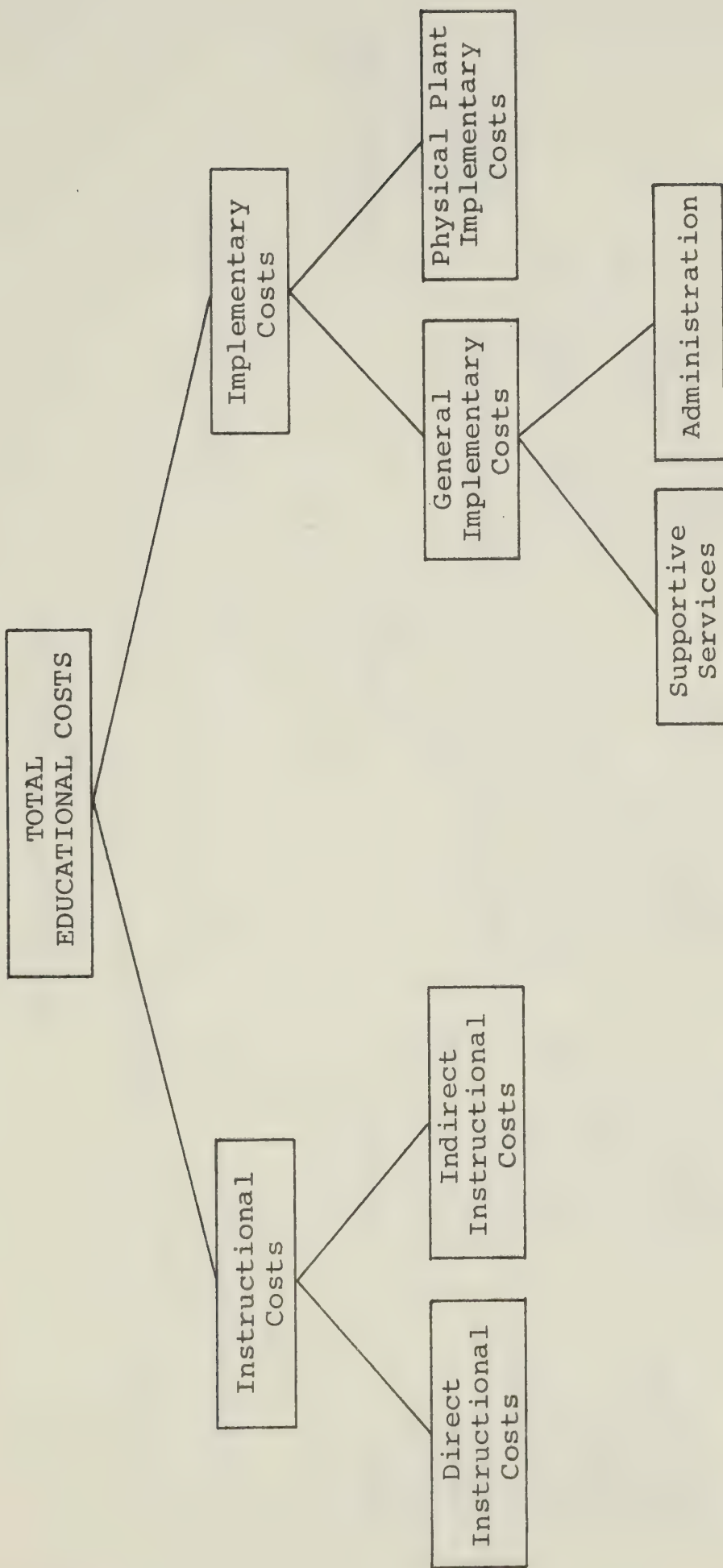


FIGURE 1a

MAJOR COMPONENTS OF TOTAL EDUCATIONAL COSTS





# AGGREGATE COSTS OF PRO- VISION FOR EDUCATION

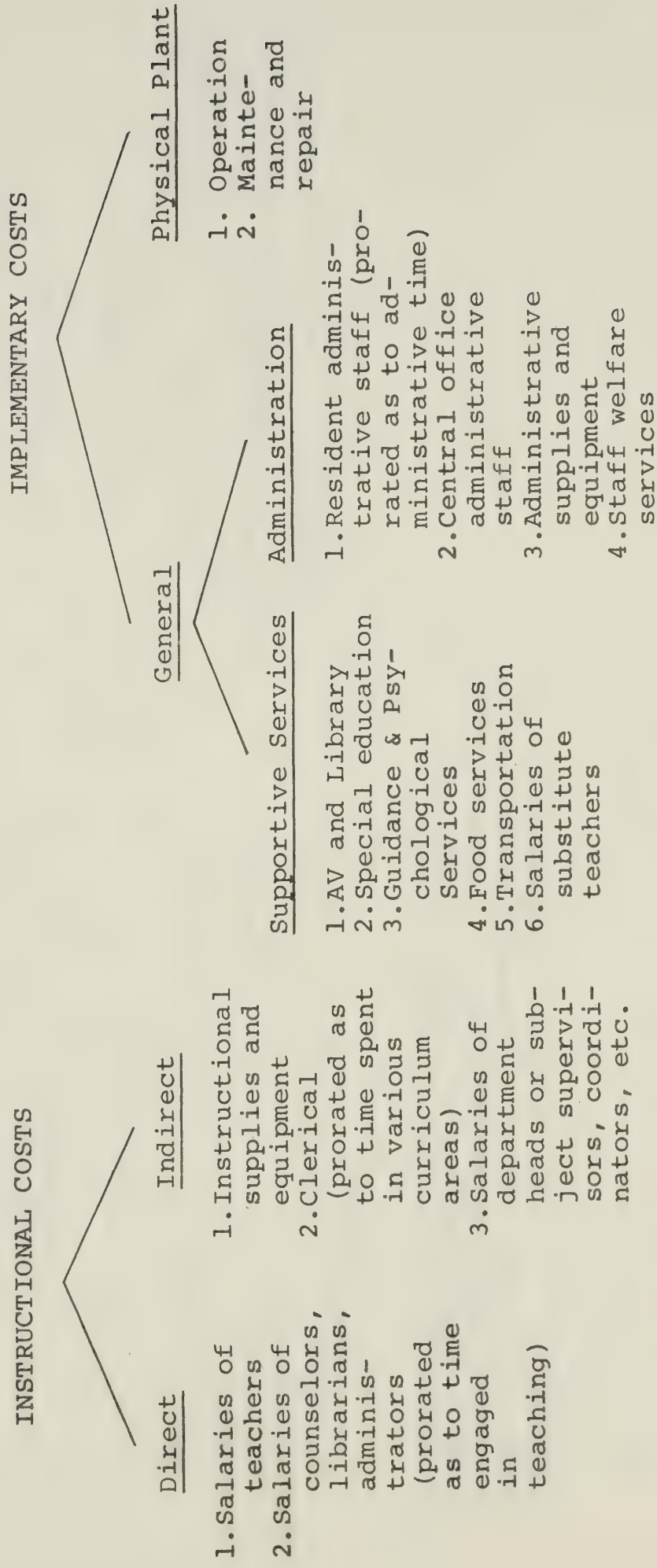


FIGURE 1b

COMPONENTS OF EDUCATIONAL COSTS (WITH ILLUSTRATIVE EXAMPLES)



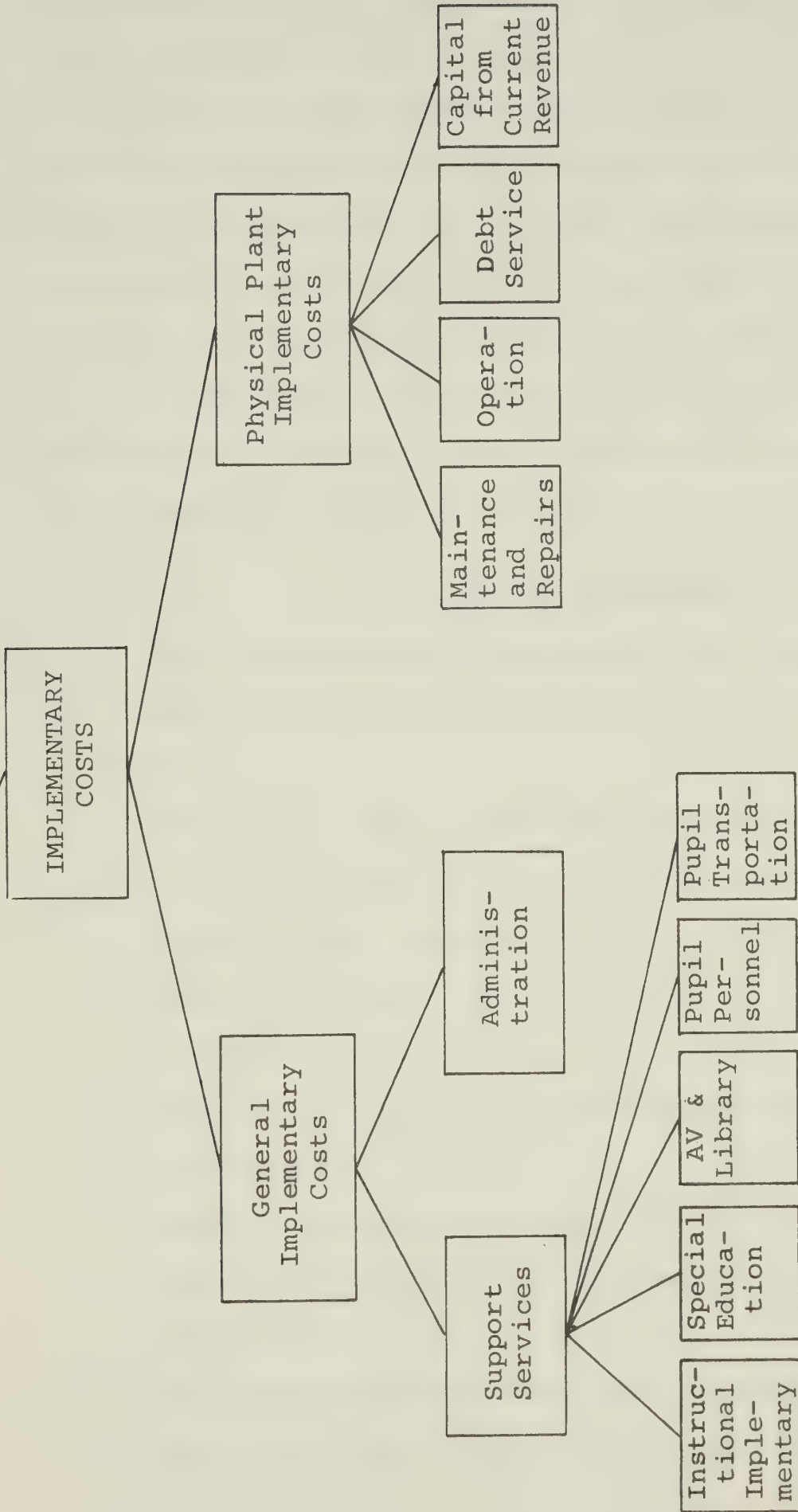


FIGURE 1c  
A FOUR-LEVEL FUNCTIONAL IMPLEMENTARY COST STRUCTURE





being carried out; (2) it approximated the accounts of the school system being analyzed in this study.

Utilizing pupil enrolment figures supplied by the central office, per pupil implementary unit costs were determined on a number of bases: by service (audio-visual, library, pupil transportation, and guidance), by function (administration, physical plant operation, etc.), and on other bases dictated by organizational or conceptual structures.

An alternative functional cost structure was also developed. As illustrated in Figure 1d, this provided another view of the relationship between functions and/or services.

### III. SPECIFIC SUB-PROBLEMS

The researcher sought the answers to the following questions, all of which relate to current expenditures except the last one (on capital expenditures):

1. What was the total implementary cost per enrolled system pupil in this urban school system for the 12-month school year, September 1, 1969, to August 31, 1970?
2. What was the general implementary cost per enrolled system pupil for the same period?
3. What was the physical plant implementary cost per enrolled system pupil?
4. What was the supportive services cost per enrolled system pupil?
5. What was the central offices administration cost per enrolled system pupil?
6. What was the plant maintenance cost per enrolled system pupil?
7. What was the plant operation cost per enrolled system pupil?



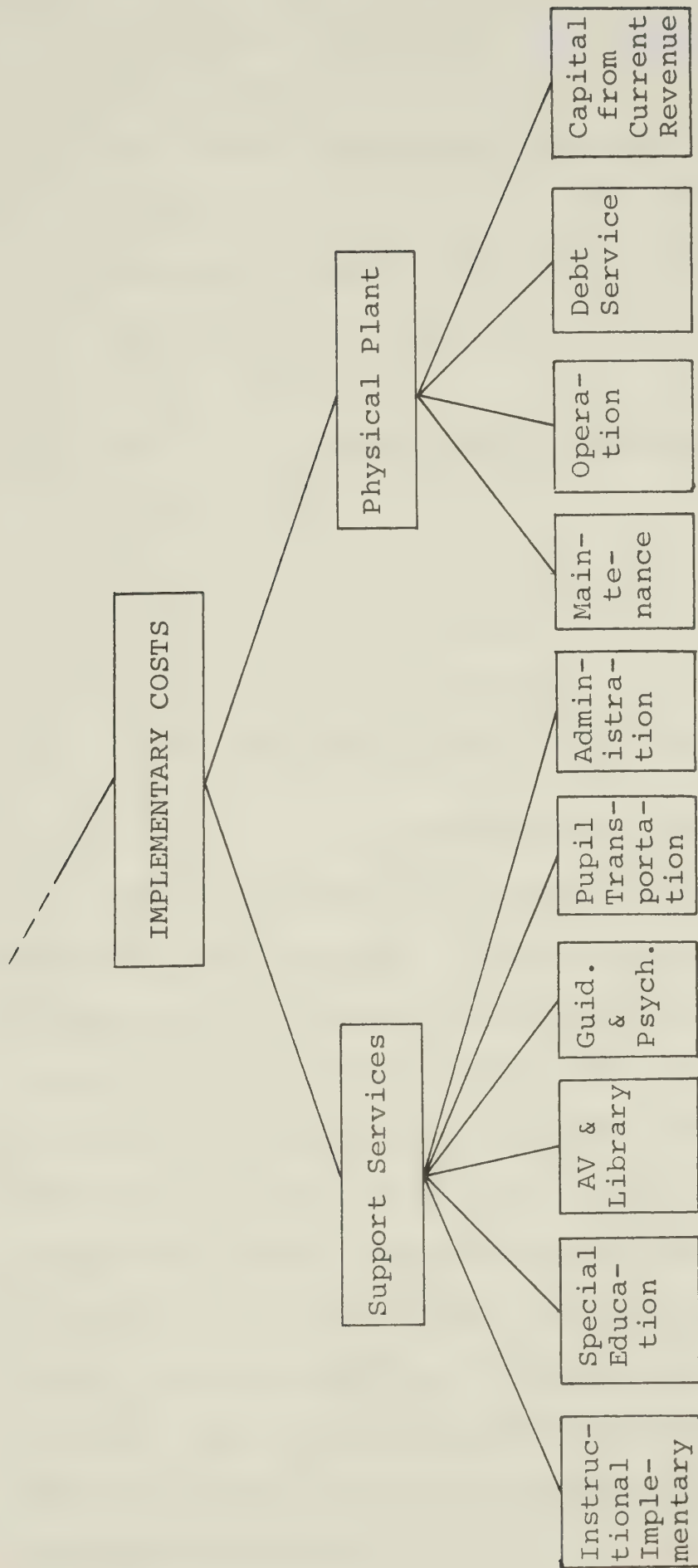


FIGURE 1d  
A THREE-LEVEL FUNCTIONAL IMPLEMENTARY COST STRUCTURE





8. What was the debt service cost per enrolled system pupil?
9. What was the capital from current revenue cost per enrolled system pupil?
10. What was the instructional implementary cost per enrolled system pupil?
11. What was the special education cost per enrolled system pupil?
12. What was the audio-visual and library services cost per enrolled system pupil?
13. What was the guidance and psychological services cost per enrolled system pupil?
14. What was the pupil transportation cost per enrolled system pupil?
15. What was the total educational cost per enrolled system pupil?
16. What was the capital expenditure for selected schools built during the calendar years 1968 and 1969?

#### IV. IMPORTANCE OF THE PROBLEM

For the importance of the overall project, see Duke (1970:11-13). As for this study, two areas of importance stand out. The first is general in character and relates to the value and need for cost analyses. Briefly stated, it is that no analysis of education can be complete or meaningful unless it includes a dollars-and-cents breakdown. Investigations which ignore cost data are impotent. Furthermore, there is a danger that if educational leaders are unwilling to analyze their services and programs in terms of the money they cost, then other people, namely specialists in systems, accounting and data processing, will do this independently of educators. This kind of cost analysis on a purely financial basis could lead to evaluation of program effectiveness without the participation of the teaching profession.



The writer is not suggesting that this is happening. On the contrary, the series of studies which has been carried out by educators demonstrates both the willingness of the profession to be involved, and the practicality of such involvement.

The second area of importance in this study is more specific. It is that cost analysis, in order to be realistic, must include figures on capital costs. Many studies in the past have ignored debt service charges and capital out of current revenue. A realistic appraisal of annual educational costs, whether total or on a per pupil basis, must include these expenditures. Granted, their inclusion makes comparison of aggregate data more difficult. However, such aggregate data can be subdivided and displayed so as to be both comparable with respect to sub-totals and complete with respect to totals.

Capital costs present their own kinds of difficulties, particularly fluctuations in monetary values over the years. However, these fluctuations can be averaged out, and the relationship of current operating expenses to capital expenses can be shown, to provide a complete picture of costs. The debt service figure appears to be the most relevant way of elucidating capital outlay

Included in this study is an examination of the capital costs of a selected number of schools on a per pupil basis. This examination was designed particularly to demonstrate that costs per pupil provide a more realistic way of evaluating the buildings than do the costs per square foot of erecting them, and to provide an indication of total amounts of capital required from some source for physical plant.

The allocation of resources to school buildings has been, and will likely continue to be, an important area for decisions. When money



for school buildings is provided from a central "foundation plan" it is important that an appropriate unit for allocation of funds be used. Cost per square foot has been a favorite yardstick used by the construction industry for evaluating building costs in general. Provincial educational authorities and school boards seem to have adopted the yardstick. The examination of capital costs presented herein attempted to demonstrate that a per pupil cost unit expresses more accurately the relationship between school building expenditures and the task for which school buildings are designed, namely, the education of the student.

#### V. DEFINITION OF TERMS

This study: The study carried out by this investigator and reported in this thesis.

Urban project: The four studies (of which this study is one) comprising the unit cost analysis of selected schools in an urban school system; used synonymously with the "overall project," or the "total project."

Province-wide study: The continuing series of cost analysis studies being carried out throughout the province of Alberta, of which the urban project is a part.

Instructional costs: Costs pertaining to curricular activities, including the salaries of persons engaged in teaching and related activities, and the costs of supplies and equipment related to teaching.

Implementary costs: Costs which cannot be assigned directly to a subject or curricular area. These are primarily the costs of support services and administration, known as general implementary costs, and





costs pertaining to physical plant. Such costs remain even if individual instructional programs were to cease.

Physical plantplementary costs: Costs pertaining specifically to physical plant, including debt service, capital out of current revenue, operation, maintenance and repairs.

Generalplementary costs: Costs of support services and administration.

Supportive Services: Services other than administration, in the generalplementary category. These include instructionalplementary services, special education, audio-visual and library services, pupil personnel and pupil transportation. (Administration is included in the alternate cost structure developed; see Figure 1d.)

Cost: Synonymous with expenditure; refers to the financial sacrifice involved in obtaining goods or services.

Direct Cost: That portion of the teacher salary that can be allocated to scheduled teaching with regular classes of pupils; mainly handled by other researchers in the urban project.

Indirect Cost: Those costs that can be assigned directly to a subject or curricular area, e.g., science equipment costs assigned to science programs; mainly handled by other researchers in the urban project.

Central Office Costs: In this study, synonymous with "unallocated-to-schools" cost; in other words, all expenditures for central offices where these were incurred at the central office (such as administration), or those incurred elsewhere in the system, but unallocated to the schools involved.

School Costs: Synonymous with "allocated-to-schools cost"; those costs which the central accounting system allocated and charged



to the schools involved; this included primarily the instructional and operation of plant categories in the Reason & White series.

Educational Costs: used in this study to mean all of the current operational costs that were examined within the limits of this study.

Audio-Visual and Library Services: Refers to all operational costs such as salaries and materiel (equipment and supplies) associated with libraries, audio-visual centers, instructional materials centres, and educational television.

Special Education: Refers only to the additional cost incurred in educating "special education" pupils (identified as such by the school system under study); in other words, only the costs for special equipment required for special education students over and above the regular supplies and equipment they would ordinarily need as regular students are charged to special education; likewise, only the portion of the salary expenditure that is in excess of the expenditure that would have been incurred had the pupils been in regular classrooms is charged to special education.

Instructional Implementary Costs: These were central office costs attributable to neither the physical plant implementary function nor the support services function.

Pupil: A person enrolled or registered in a course or in a school during the period in which the count was taken.

System Pupil: A pupil enrolled in a program carried out in district-owned facilities and taught by district-paid teachers.

Elementary Pupil: A system pupil enrolled at the elementary level (grades 1 to 6).





Junior High Pupil: A system pupil enrolled at the Junior High School level (grades 7 to 9).

Senior High Pupil: A system pupil enrolled at the Senior High School level (grades 10 to 12).

Client Pupil: A pupil identified as a member of a particular target group, e.g., special education pupils, pupils who receive guidance and counselling assistance, or students registered in physical education classes.

Target Pupil: Synonymous with the client pupil.

School Year: The period from September 1, 1969 to August 31, 1970.

Unit Cost: Relates to the type of costs being derived; e.g., a unit cost may be referred to as a system pupil cost, a client or target pupil cost, an elementary pupil cost, a teaching station or pupil space cost, etc., depending upon the point under investigation.

Pupil Space: The theoretical amount of room required by a pupil enrolled or registered in a school or course.

Average: Synonymous with "mean" in this study.

Current Expenditures: In this study, synonymous with "current operating expenditures"; examples are salaries for professional and support staff, payments for expendable supplies and equipment, debt service (including principal and interest), and capital expenditures for equipment or other assets when these are made out of current revenue. In accounting terminology, "current expenditures" or "current operating expenditures" are often referred to as "revenue expenditures."

Capital Expenditures: Expenditures for the purchase of land, buildings, and other "permanent" properties; in this study, capital



expenditure included only those capital expenditures that were amortized over a number of years; capital expenditures out of current revenue were categorized as current operating expenditures for the purposes of this study.

Not all terms used in this study that require definition are included above. A number of terms have been defined in the appropriate place throughout the study. However, the key working definitions pertinent to the stated problems are listed.



## CHAPTER II

### REVIEW OF THE RELATED LITERATURE

#### I. COST ANALYSIS DEFINED

Fowlkes and Hansen (1952:471), speaking at a national conference of professors of educational administration in New York, offered this definition of educational cost analysis:

Cost Analysis is the process of studying the total cost of public education for a given community, state, or area for the given year; trends in total school costs; the costs of specific services, e.g., transportation or English; the cost of education by grades or levels, e.g., elementary school costs, secondary school costs; costs of non-attendance; costs and tax paying ability; cost and size of school; reasons for increased costs; reasons for decreased costs; need for increased costs and need for decrease in costs.

Knezevich and Fowlkes (1960:166-67), shed further light on the subject, as follows:

Increasing public school costs can be traced to better attendance for longer periods, more comprehensive educational programs, rising price levels, and the improved economic status of the professional staff in public schools. Cost accounting for schools endeavours to ascertain and evaluate the costs of operating various phases of the educational program. Unit cost analysis goes a step further in attempting to relate what was accomplished to the price paid. The fundamental purpose of cost accounting or unit cost analysis is to aid management in controlling current and future operations.

All cost studies originate in the accounting system. All unit cost analysis will reflect the limitations and advantages of the financial information available and the design and procedures in accounting.

A well-designed and well-kept account system will facilitate gathering cost data but cannot guarantee the correct interpretation of such information.

#### II. HISTORICAL PERSPECTIVE

Cost analysis naturally has always been a fundamental practice in the business world, where survival is directly linked to the ability of business establishments to compete with other businesses in a milieu governed by the laws of supply and demand.





Writings on cost accounting in the business world began largely with Charles Babbage in England (circa 1830), and Pagen, Mezieres, and Malo in France about the same time. It was more than a century afterwards, in the in the late 1940's and early fifties, that demands began to be made on governmental units in the United States for application of cost accounting techniques and principles to their own operations. The Encyclopedia Britannica (1969:VI,590) states:

Difficulties arose with regard to the measurement of certain governmental and institutional services, and unfortunately many costs exhibited erratic behaviour. Many institutions and governmental units that were using budgets primarily as expenditure controls installed performance budgeting, which combines financial controls with standard costing. Many school systems, universities, hospitals and clubs rapidly adopted similar types of performance budgeting. The problem of costing has been studied by the government in Great Britain, particularly in relation to the cost of medical services.

This movement which began at mid-century in the United States eventually became quite extensive. There had been isolated cost studies earlier, of course, but not on any large scale. They were conducted mainly in institutes of higher learning, and were harbingers of the major developments in the fifties, when the emphasis was placed on conducting cost analysis along the lines of accepted accounting practices in the business world. In higher education, cost studies may have been conducted as far back as the early 1930's, as indicated in the following remarks from the National Committee on Standard Reports for Institutions of Higher Education, appearing in 1935 in Financial Reports for Colleges and Universities (p. 177):

If properly conducted, cost studies should be of value in the internal administration of educational institutions. The determination of costs may well be considered one of the first steps in a complete analysis of the administrative and financial practices within an institution. Variations in costs between departments of instruction, schools and colleges, curriculums, and levels of student achievement, or variations in costs for the institution as a whole over a period of years, should lead at once to a further examination of the factors that determine costs. Chief among these factors are the following: size of enrollment, size of classes, number of faculty members, teaching loads, salary schedule of faculty members, curricular offerings, and efficiency



in the use of the facilities of the educational plant.

Unit-cost studies, furthermore, may be of value in the determination of the rates of student fees, in the preparation of the budget, in educational surveys, in the accreditation of educational institutions, and in the determination of desirable reorganization within an institution or within systems of higher education.

McLure (1957:2) reported on the state of educational cost analysis in Illinois in the early fifties. The problem, he said, was that "the increasing complexities of public education, with incessant financial requirements, are demanding more precise knowledge of cost analysis." He felt that questions which were going unanswered "for lack of better information" (p. 3) included the following:

1. On what basis can the amount of expenditures for one category be judged in relation to other categories?
2. What is the effect of expenditures in one category on the total accomplishments of the school system?
3. Are there limits of expense in some categories beyond which further expenditures will not improve educational results?
4. What are the categories in which increased expenditures are most likely to yield the greatest educational results?
5. On what bases can economies be judged in each category?

### III. BUSINESS PRINCIPLES APPLIED

Certainly few writers suggest that educational cost analysis should be carried out for the same competitive reasons as business analysis of private enterprises, but on the other hand there are even fewer writers who deny that cost analysis in education provides the kinds of data which decision-makers need in order to allocate intelligently the limited financial resources available to them, with due regard to priorities in programs, services, equipment, facilities, and administrative costs.

Rosenstengel and Eastmond (1957:253) reflected the early concerns about applying business principles to educational administration, when they stated in their manual on School Finance:





Cost accounting has always had an important place in the management of a business. It is essential for the manager of a factory to know how much labor and materials cost for producing any particular item. Business spends much money making time and motion studies. Only through studies can production costs be reduced. Although schools are not operated on the same principles as business, the administration can improve in management by using some practices which have proved beneficial to business.

The greatest values derived from an analysis of the educational program of a school system through costs are in managing the finances, in determining school policies, and in gaining lay support of the program.

Burke (1957:133-34) identified the information vacuum existing in education -- a vacuum in which it was all too easy to make assumptions not based on fact.

There is a dearth of descriptive statistics on the educational programs in the various states and local school units. Educators frequently have assumed that low expenditure levels mean meager education programs. Critics often have assumed that all programs are about the same and high expenditure levels are the result of poor management.

The available statistical series contain very little data on programs and services. . . .

. . . The statistics do not show what objectives the schools are attempting to attain, the relative emphasis that is being placed upon each, the programs or services developed to advance the various purposes, the practices followed in carrying out the programs, and the results achieved.

Benson (1961:374-75) made similar observations:

In general, cost accounting exists in only a crude form in Education. Development of this aspect of school management should not be regarded as a cold, mechanistic (i.e., "rule-of-thumb") compilation of dollar outlays, but as a conscientious attempt to weigh the alternative costs of accomplishing given ends, to the purpose that the teacher's time (or similarly, the student's time) can be more effectively spent.

Lindman (1968:66) commented on the inadequacy of traditional accounting methods in education:

The accounting system was established when public schools offered for all students a single program with few, if any, auxiliary services. Since then, school programs have become complex and varied; and the single-dimension accounting system, even with its amendments and additions, is hopelessly inadequate.

Hull (1961:372-73) pointed out that the electronic computer makes possible revolutionary new developments in cost analysis:



. . .the flexibility of data-processing equipment makes it possible to separate and examine innumerable kinds of component costs. It is this flexibility, in fact, which makes the cost study an invaluable tool for research into many aspects of the activities of an institution. . . Indeed, it might be said that the cost study justifies itself solely by its usefulness in answering the spate of questionnaires that crosses the desks of administrators and faculty alike.

He outlined a number of possible pitfalls in cost analysis (pp. 373 - 75), as follows:

1. The quantitative measures of performance currently utilized are not accurate.
2. The use of cost studies may imply that cost is the most important aspect of the educational climate.
3. By charging all expenditures back to instruction, real costs may be obscured, and real instructional costs may be distorted.
4. The nature of cost-study data may lead to faulty interpretations, misuses, and the establishment of improper relationships.
5. The availability of cost-study data may lead to abuses resulting from excessive zeal to reduce costs.

While acknowledging the possible pitfalls, however, Hull concluded (p. 376) that "the positive benefits of cost studies far outweigh their disadvantages."

#### IV. THE TREND ACCELERATES

The fifties, then, were characterized by a general move towards adopting business principles in analyzing educational costs. As we move into the sixties we see this trend taking shape, and through the sixties we can watch it accelerating. Tyndall and Barnes (1962:118), although concerned primarily with post-secondary education, pointed out the accelerating trend applicable to all levels of education:

. . .Unit cost studies will become of increasing importance as the problems facing institutions of higher education grow in importance and complexity.

Burkhead (1964:9-10) viewed the accelerating trend this way:

The economic analysis of investment in education is in its infancy.





Much additional research is now in progress and it can be expected that much more will be undertaken, not only in the economics of education but in other aspects of human resources. Thus far the operational content of the research is meager. Neither the conceptual apparatus nor the empirical work has reached the point of providing answers to those who must make decisions about whether this or that educational program should be expanded or contracted--whether more or fewer resources should be channeled to the support of specific programs.

Charles S. Benson (1966:285), speaking at a Symposium on Measurement of Quality in Education at the 132nd Annual Meeting of the American Association for the Advancement of Science, Berkeley, California, indicated a personal belief in the effectiveness of cost analysis in education, and a similar belief on the part of colleagues at the symposium, when he stated:

Happily, the papers presented here point toward the development of rational systems for allocating resources in education, and neither the difficulties we can see ahead in accumulating relevant data nor the complexities of school operations are likely to turn the tide that is now running in educational policy making.

In the midst of all the excitement about the possibilities offered by cost analysis the well-known British writer on the economics of education, Vaizey (1968:80), visited the United States and, after having toured some educational institutions featuring elaborate learning machines, commented on the mechanization of education:

In these and other experiments a complex procedure of replacing labour by machines, and using machines to subdivide the teachers' tasks is proceeding just as it did in Adam Smith's pin factory. The unpleasantness of individual experiments to those of us more accustomed to the easier, more slipshod labour-intensive methods of ordinary education should not blind us to the historical trend which is inevitable in a society where capital is more abundant (relatively) than skills.

Vaizey's comments should remind educational administrators in North America that cost-saving and labor-saving must never be sought at the expense of human values.

Vaizey's writings, actually, are quite balanced. He himself advocates cost analysis, as seen in his comments in UNESCO's manual on The Costing of Educational Plans (Vaizey, 1967:11):





. . . There is no administrator in the world who has more resources than he can use. It is essential that . . . choices are based on an accurate assessment of the cost situation.

An understanding of the principles of costing educational programmes, therefore, underlies the major part of the task which the educational administrator and planner has to undertake. By an analysis of the problems involved in costing, and an understanding of the techniques which have been developed for the best methods of costing, the formulation and implementation of educational plans will be substantially improved.

#### V. STUDIES IN CANADA

The majority of the works cited to this point have been by authors in the United States. There are writers who have studied the Canadian scene and have commented on it in particular, although their studies for the most part have not been widely circulated. Among them is Wilfred J. Brown (1967:33), Economics Officer for the Canadian Teachers' Federation, who states:

. . . Many educators fear that the application of economic analysis to education would divert resources from it by the false economy of cutting costs, per se. A more fundamental objection to innovation and productivity advances is the fear that education would become a mass production affair and that its humanistic and moralistic goals would be compromised. While the full catalogue of reasons for this attitude, rightly or wrongly felt, is long and complex, one of the principal causes is a misunderstanding of economic analysis. All such an approach attempts to do is make the best possible use of the available resources within the framework of values which the community has decreed. Surely, no one would object to getting more of whatever is wanted with the effort that is now being made.

He continues (p. 36):

. . . The difficulties of determining the causal relationships of productivity in an industry with an output as diffused as that of education may well be insuperable.

He maintains (p. 41) that our school systems must learn:

. . . What the private sector of the economy learned long ago of necessity--that resources can and must go farther in the future than they have in the past.

The government body which appears to have contributed most towards educational cost analysis, both by way of providing relevant data on a



national scale and encouraging educational planning, is the Dominion Bureau of Statistics. In a manual of Education Planning and the Expanding Economy, issued in co-operation with the Department of Trade and Commerce, the Bureau states (DBS, 1964:53):

The strategy of education planning is in its infancy although ad hoc and limited area planning are as old as the establishment of schools. A growing recognition that education can be an important factor in economic expansion and will inevitably be concerned with the concomitant social changes has focussed attention on the need for more sophisticated and co-ordinated planning. It can reasonably be expected that year by year a better organized body of knowledge will become available for those competent in the field, the number of whom should increase.

At the provincial level, recent writers at the University of Alberta who have carried out actual cost analysis projects in specified school systems include Duke (1970), Myroon (1969), Palethorpe (1970), Eurchuk (1970), and Purkess (1971). For a general review of cost analysis, accounting systems, proration, and outputs, see Myroon (pp. 3-8) and Duke (pp. 16-24). These provide the framework for this study.

Among Duke's conclusions (pp. 232-33) were (1) that "there is an immediate need for a standardized accounting system in this province"; and (2) there is a need for

. . . a reporting format that provides more information than the conventional, function-object budget report. A flexible, programmatic design is needed to facilitate the identification of mission-oriented activities and the operationalization of goals.

Both Duke and Myroon are members of the Alberta Department of Education team who produced a service document entitled Program Accounting and Budgeting Manual. In its Interim Edition (1972) the manual was widely circulated among school districts throughout the province in an effort to stimulate constructive educational cost analysis, and to bring about, as much as possible, the kind of uniformity in this cost analysis which will permit useful comparisons and will contribute to intelligent decision-making in the allocation of provincial funds to education.





The Minister of Education, Louis D. Hyndman, in his introductory remarks in the Interim Edition, said:

School boards and the public at large have become increasingly concerned about the allocation of limited resources. As the demands for resources have increased a corresponding counter-demand has developed for accountability in terms of what has been accomplished.

Many school administrators now recognize the inherent limitations in existing budgetary processes. There is ever-increasing pressure to establish improved methods for planning and allocating resources more effectively, and for the more efficient management of these resources. The conventional line-item incremental budget does not provide much information that helps to relate resource allocations to educational objectives.

## VI. THE POLITICAL ARENA

The minister's preface to the Department of Education manual acts as a reminder that educational finance and politics are naturally very closely intertwined in a democratic society.

Much of the groundwork for the educational scene as the new minister has inherited it was laid in the days of his political forebears. The views of his immediate predecessor, former Education Minister Robert C. Clark, are illustrative. A clear indication of Clark's fears about educational costs was contained in a speech he made at a southern Alberta Chamber of Commerce meeting in the spring of 1970, in which he is reported to have stated (Clark, 1970) that cost increases must be stopped "if a taxpayer revolt against educational expenditures is to be avoided."

He said that during the previous year less than half the plebiscites on school buildings in North America were approved and in some areas it was not possible to gain approval for plebiscites on school operating budgets. He maintained that Alberta can take a "reasonable" approach to educational costs or in two, three or four years "face a backlash which will leave a very real and lasting scar on young people and on the educational system." He said that the cost of education in Alberta on a per capita basis was the



highest in Canada, and while education would continue to be the top priority of the government's program, cost increases "must be kept more in line with provincial and national productivity increases."

The answer as to whether politicians are being over-insistent in calling for the application of business criteria to educational services and processes as well as to private enterprise is not within the scope of this thesis. Rightly or wrongly, however, it is a fact of life that not only provincial politicians, but also elected school board officials, chosen by the people to represent what they regard as the public interest in education, are calling for more cost analysis. Typical of their opinions is that of Raymond Clark (1971:1), past president of the Alberta School Trustees' Association, writing in the April issue of the Association's official publication:

An attempt to fit procedures used in business into education would no doubt draw the criticism of many sincere and dedicated educators who regard education in a sphere of its own and outside the area of private enterprise and competition. However, it is my belief that educators can no longer afford the luxury of such viewpoints. . . .

## VII. SUMMARY

To summarize, cost analysis in education takes into account all aspects of expenditures in the school or system being analyzed. These include trends in costs, costs of specific services, various levels of instruction, size of schools and/or classes, reasons and need for cost increases or decreases, and availability of funds.

Cost analysis along the lines of accounting principles which had been applied to business for more than a century had its major beginnings in government services, including education, about the middle of the twentieth century. Writers in the fifties were basically defining cost analysis and outlining the kinds of data for which there was a need if the process was to be meaningful and effective. The sixties saw the trend taking



shape and accelerating.

Canadian literature on the subject is not yet extensive or widely circulated. Much of what there is comes from professors and students of educational administration, associations such as teachers' federations, and government bodies such as the Dominion Bureau of Statistics.

In the political arena there is increasing pressure for more accountability and public knowledge about how the education dollar is being spent. This is resulting in demands for the institution of program budgeting and accounting practices in school systems.

There is no question about the fact that educational expenditures have increased over the years. But as Atherton et al. (1969:56) point out, this is no cause for undue alarm.

. . . Although total expenditures in education had increased almost sevenfold in the period 1950-66 substantial increases in enrolments and price level had accounted for all but a small annual proportion. A study of what actually happened suggests that the very nature of the educational process with its emphasis on personal relationships means that prices will continue to increase at a level higher than other prices in the economy.





## CHAPTER III

### DESIGN OF THE STUDY

#### I. GENERAL OUTLINE

For the design of the total project, of which this study was a part, see Duke (1970:44-71). Figure 2 indicates the cost analysis methodology as seen from the point of view of the overall project. The supplementary cost input details not shown in Figure 2 are shown in Figure 1b and 1c in Chapter I.

The supplementary costs in this study were broken into two groups: general supplementary costs and physical plant supplementary costs. General supplementary expenses were those associated with central office administration and such support services as pupil personnel, transportation, and library services. Physical plant supplementary expenses included maintenance and repair, operation of plant, debt service (principal and interest), and capital outlay out of current revenue for both school plant and central office plant. Non-current capital expenditures were also investigated.

Duke's mathematical notation was as follows:

$$\text{Total Unit Cost} = \frac{\text{Instructional Expenditures} + \text{Supplementary Expenditures}}{\text{Appropriate Unit of Auxiliary Data}}$$

In actuality, and with the use of electronic data processing equipment, each researcher worked out his unit costs independently and the individual unit costs were aggregated to give the same result as in the mathematical notation above. For example, this study computed such



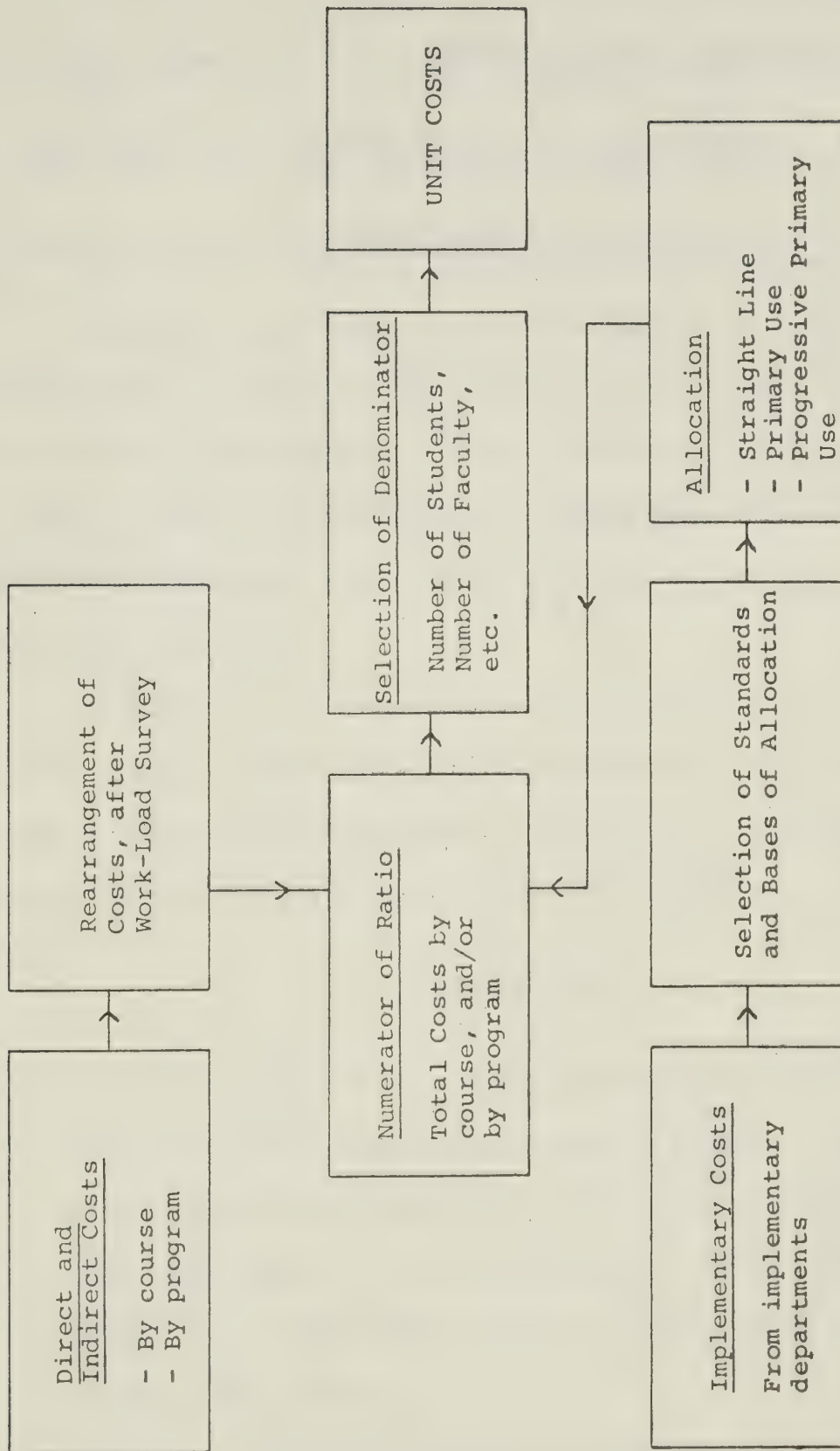


FIGURE 2

A UNIT COST ANALYSIS METHODOLOGY





implementary unit costs as the following:

1. Total Imp. Unit Cost =  $\frac{\text{Total Implementary Expenditures for System}}{\text{Total No. of Enrolled Pupils in System}}$
2. Physical Plant Unit Cost =  $\frac{\text{Physical Plant Expenditures for System}}{\text{No. of Enrolled Pupils in System}}$
3. Admin. Unit Cost =  $\frac{\text{Admin. Expenditures for System}}{\text{No. of Enrolled Pupils in System}}$
4. Support Unit Cost =  $\frac{\text{System Support or Service Costs}}{\text{No. of Enrolled Pupils in System}}$

Individual unit costs (such as numbers 2, 3, and 4, above) were added together to give other unit costs (such as number 1 above) at various levels of aggregation. Total implementary unit costs were in turn added to total instructional unit costs (supplied by the other researchers) to provide Duke's study with aggregated costs for various programs and schools.

In addition to determining unit implementary costs as above, this study was closely integrated with the Duke study (1970) in the cost analysis of several non-curricular programs, e.g., library, counselling, and other general programs, such as special education programs.

## II. ASSUMPTIONS

Several assumptions were made with respect to this study:

1. Utilizing actual expenditures made in 1969 and adding to them prorated budgeted figures for 1970 yielded estimated expenditures that were close to actual expenditures for the 1969-70 school year.
2. Records from which the necessary cost data were extracted were complete and accurate.
3. Bases and standards selected for proration of implementary costs were reasonably accurate.



### III. DELIMITATIONS

This study was delimited to:

1. with respect to operating costs, the actual expenditures made by the urban school system during the 12-month school year 1969-70;
2. with respect to capital costs, expenditures for school buildings constructed during the calendar years 1968 and 1969;
3. the analysis of implementary expenditures in the system (but including those instructional costs not allocated to schools);
4. regular day students (including special education students in regular or special schools owned by the urban school system);
5. grades one to twelve;
6. cost figures, not cost-effectiveness, cost-benefit, nor in-depth analyses.

### IV. LIMITATIONS

The emphasis in this study was on description, i.e., various implementary unit costs at different levels of aggregation. The results were not investigated but may provide others with a basis for advancing hypotheses. The limitation of this study to one school system precludes the generalization of the findings.

Burke (1957:121) contends that "the only defensible use of per pupil expenditure comparisons is to offer a challenge for explaining differences or lack of differences." That challenge was left to future researchers in this area.

Burke (p. 120) details three factors which contribute to the limitation of unit cost studies generally:



1. The lack of a unit of measure which is unchanging, e.g., a weighted pupil.
2. Lack of a uniform cost accounting system.
3. Lack of uniform standards or specifications for describing the goods or services whose cost is to be compared.

All three of these factors would limit the usefulness of this study.





## CHAPTER IV

### RESEARCH PROCEDURES

#### I. INTRODUCTION

The research procedures involved five phases essentially:

1. investigation of the existing cost structure and accounting system,
2. extraction of cost data,
3. allocation of cost data to standard expenditure accounts,
4. development of a functional cost structure, and
5. acquisition of auxiliary data and computation of unit costs for both the standard expenditure categories and the functional cost structure.

#### II. EXISTING COST STRUCTURE AND ACCOUNTING SYSTEM

The budget document of the urban system identified four broad expenditure categories, namely:

1. Financial Charges,
2. Administrative,
3. Instructional, and
4. Maintenance (which included operation of buildings).

Each of these expenditure categories comprised numerous numbered expenditure accounts, against which payments were charged during the course of the fiscal year. Thus with respect to expenditures, the accounting system was basically a cash entry system. However, monthly computer reports were



provided to unit managers which attempted a display of information on an encumbrance basis and each of the accounts as encumbered at the fiscal year end (December 31).

### III. EXTRACTION OF COST DATA

Four main data sources were utilized. These are listed below with sub-source where applicable:

1. The 1969 and 1970 budget document
2. Computer printouts
  - a. teacher payroll printouts (two)
  - b. support staff payroll printouts
  - c. direct charges printout
  - d. inventory charges printout
3. The general ledger
4. Appropriate central office personnel

The 1969 budget document served as an initial structuring tool and as a check as the data gathering progressed. The 1970 document was particularly useful for obtaining system figures in such areas as plant maintenance or debt service, since it aggregated actual cost data from the general ledger for the previous year (1969) in addition to estimating 1970 expenditures. However, it did not report teacher and support staff salaries in sufficient detail to assist in allocation of certain costs (e.g., administrative, guidance, special education) and hence the computer printouts were particularly consulted in these areas.

The computer printouts provided accumulated expenditures from the general ledger. The teacher payroll printouts were consulted for the salaries of those central office personnel classified as teachers. The



95 individuals involved were certificated teachers, the majority of them located in the guidance and curriculum departments of the central office. Also obtained were expenditures for teachers on leave for various reasons. (An interesting anomaly was the inclusion of male staff members on the computer printout for the "maternity leave" category, a "catch-all" category as it turned out.) One printout provided the names of the teachers by location and the other gave an alphabetical listing of names including annual salaries for the school year 1969-70, years of education and years of experience. These printouts were updated monthly, the March 31, 1970 run being consulted for the study.

The support staff payroll printout contained the names and salaries of the rest of the central office personnel, including administrative, supervisory, secretarial, clerical, custodial, and maintenance staff. Bi-weekly salaries or hourly wages only were given on the printout, not annual figures, so it was necessary to calculate the latter. Since support staff raises are normally effective September 1, the March 31, 1970 run in effect provided bi-monthly or hourly figures for the 1969-70 school year under investigation in the study. However, shortly after the 1969-70 figure had been calculated, all support staff (except maintenance and custodial staff) received raises retroactive to January 1, 1970, thus necessitating a re-calculation of all expenditure accounts derived from the source. Normally, though, one calculation from this bi-weekly run would provide the school year figure required.

The direct charges and inventory charges printout, in addition to school allocation, accumulated the unallocated (to schools) indirect costs, central office expenditures for all items except payroll, and system maintenance costs including payroll. These monthly printouts provided





year-to-date expenditures for each account. The December 31, 1969 printouts were consulted, then, for total expenditures for each account for the fiscal year 1969.

The general ledger was consulted only where coding errors occurred or where obvious discrepancies were noted between the printout figures and the budget document figures for that account. Discrepancies were resolved in favor of the general ledger, the source for the accumulated computer printout figures for each account.

The unallocated (to schools) indirect costs were accumulated for each account and assigned to the subject area involved. However, except for music (which charged instruments to the central office) these costs were not very large. Therefore, they were ultimately lumped together and a per pupil cost by grade division was computed for them for the Duke study. The required 1969-70 figures (except for music) were arrived at from the obtained 1969 figures by adding ten percent. This projection statistic was the least reliable one employed in this study, but was utilized on the advice of officials in the accounting department. "The trouble with these costs," said one senior staff member, "is that the individual figures comprising them are not large enough to justify a search for the school to which they should have been allocated. Actually these unallocated costs may go up by ten percent, which is most likely, or down by ten percent, or they may stay the same."

Actual central office expenditure (except payroll) and the system maintenance costs (including payroll) for 1969 were extracted from the December 31, 1969 printouts also, but projected 1970 costs for each account were established by reference to the 1970 budget document. 1969-70 figures for each of the 101 accounts were established by summing one-third



of the actual 1969 figure (September - December 1969) and two-thirds of the projected 1970 figure (January - August 1970). In practice, the algebraic sum of the 1969 figure and two-thirds of the difference between the 1970 and 1969 figure provided the required 1969-70 figure, as can be demonstrated by the resolution of the equation

$$1/3x + 2/3y = z$$

into

$$x + 2/3(y-x) = z$$

where:

x = the expenditure for the calendar year 1969

y = the expenditure for the calendar year 1970

z = the expenditure for the school year 1969-70.

The rationale for using the above projection procedure as opposed to a projection of accumulated actual September 1969 - March 1970 figures, for example, involves the non-linear nature of these expenditures. There is no way of determining, without reference to previous years' expenditures, whether any arbitrary set of consecutive monthly expenditures for a portion of the year were in any way representative of total costs for the 1969-70 school year. Even historical data could not guarantee the same pattern for the year under study. Accountants of the urban system pointed out that large maintenance costs or central office expenditures, for example, might occur outside of, or within, the arbitrarily selected period and thus the projection based on the selected period would be too low or too high. On the other hand, the 1970 budget figures were estimated by the most knowledgeable officials in the system for each account or set of accounts comprising an area of responsibility. Hence, their accuracy would be of a considerably higher order than that provided by



any combination of linear or non-linear projections based on an arbitrary set of consecutive monthly expenditures figures.

Furthermore, as one senior administrator in the system pointed out, "Who is to say whether the ongoing administrative and maintenance costs apply more particularly to one school year's set of students than to another? Allocating an arbitrary portion of each fiscal year's expenditures to the school year provides as accurate an annual cost picture as you are going to get without resorting to a longitudinal study."

Appropriate central office personnel were consulted throughout the investigation, initially to define general areas of responsibility, the direction of inquiry, and the location of data sources; and then, later, in connection with specific questions which arose during the course of the study, such as which expenditure item comprised an account, why an expenditure was handled in a certain way, and numerous questions involving the intricacies of the data processing and accounting systems. Thirty-six officials and their assistants were consulted, either by structured interview or informal visit, in the early stages of the investigation. Of these, eleven located in the accounting and data processing departments were consulted constantly in order to obtain the answers to emerging questions. Cooperation was excellent throughout--no doubt a consequence of the previous approval for the study by the chief executive of the organization.

A particular contribution of the central office personnel was their assistance in establishing central office and maintenance cost figures for the school year 1969-70. It was their expertise that provided the accurate estimations in the budget document of costs for the fiscal year 1970 and it was their recommendation that led to the





utilization of those figures in computing the 1969-70 costs. It was their suggestions which led to the decision to use the sum of one-third of the actual 1969 expenditures and two-thirds of the estimated 1970 expenditures, for each account, in arriving at reliable 1969-70 cost figures.

#### IV. ALLOCATION TO STANDARD EXPENDITURE ACCOUNTS

Standard expenditure accounts were utilized as the vehicle for allocating costs to provide for comparability among and between the series of Alberta cost studies, of which this study is one. Myroon (1969:23-45) was the first of the series of studies and hence established the Reason and White standard expenditure accounts as the uniform vehicle for the subsequent studies (Reason and White, 1966: Chapter 4).

In practice, the allocation of cost data to the Reason and White standard expenditure accounts occurred simultaneously with the previous phase of the research procedures, that of extraction of cost data, but it was separated here for analytical purposes.

The standard expenditure accounts, as suggested by Reason and White (1966:Ch.3), e.g., administration, instruction, plant operation, etc., are listed in Figure 3. Figure 4 provides some examples of functional-character-objects under the functional-character classification. An example of an object would be "Caretakers' Salaries" which would be entered under "Salaries" under the functional-character classification of "Plant Operation." For a complete listing of objects, see Tables I to VIII, inclusive, in Chapter V.

This study was confined to unit cost analyses for all of Series 100, Series 300 through 800 (central offices portion only of 600), Series 1200 through 1400, and parts of Series 200, all of which record



Series	100	ADMINISTRATION
	200	INSTRUCTION
	300	ATTENDANCE SERVICES
	400	HEALTH SERVICES
	500	PUPIL TRANSPORTATION SERVICE
	600	PLANT OPERATION
	700	PLANT MAINTENANCE
	800	FIXED CHARGES
	900	FOOD SERVICES
	1000	STUDENT BODY ACTIVITIES
	1100	COMMUNITY SERVICES
	1200	CAPITAL OUTLAY (CURRENT REVENUE)
	1300	DEBT SERVICE FROM CURRENT FUNDS
	1400	OUTGOING TRANSFER ACCOUNTS

FIGURE 3

FUNCTIONAL-CHARACTER CLASSIFICATION OF EDUCATIONAL  
EXPENDITURES NECESSARY FOR COST ANALYSIS  
(Adapted from Reason and White,  
Chapter 3)



Series:	100	ADMINISTRATION
		110. C.O. Salaries
		120. Contracted Services
		130. Other Expenses
	200	INSTRUCTION
		210. Salaries
		210.a. Substitute Teachers
		210.b. Curriculum Supervision
		210.c. Centralized Library Services
		210.d. Centralized AV Services
		210.e. Centralized Guidance & Psychological Services
		210.f. Teacher Interns
		210.g. Sabbatical Leave
		210.h. Misc. Leave
		210.i. Instructional Improvement
		220. Textbooks (Binding)
		230. Centralized AV & Library Materiel
		240. Etc. (See Table II)
	300	ATTENDANCE
	400	HEALTH SERVICES
	500	PUPIL TRANSPORTATION SERVICES
	600	PLANT OPERATION
		610. Salaries, C.O.(Central Offices) & Unallocated-to-Schools
		620. Contracted Services
		630. Heat for C.O. Buildings
		640. Utilities for C.O. Bldgs. (except Heat)
		650. C.O. Supplies, except Utilities
		660. Other Expenses
	700	PLANT MAINTENANCE
	800	FIXED CHARGES
	1200	CAPITAL OUTLAY OUT OF CURRENT REVENUE
	1300	DEBT SERVICE
	1400	OUTGOING TRANSFER ACCOUNTS

FIGURE 4

FUNCTIONAL-CHARACTER-OBJECT CLASSIFICATION OF  
 EDUCATION EXPENDITURE ACCOUNTS NECESSARY  
 FOR UNIT COST ANALYSIS  
 (Adapted from Reason &  
 White, Chapter 3)





implementary expenditures as defined earlier. This study was also confined chiefly to system costs, the resident school costs being supplied by the other researchers, except for a few unallocated resident school costs.

One of the particular problems encountered in allocating costs was the fact that the four broad expenditure categories of the urban system under study coincided rather poorly with the expenditure categories by the same name from Reason and White. In addition, there were many additional categories in Reason and White that not only did not coincide with sub-categories utilized by the urban system, but did not coincide even with individual accounts in the urban system. For example, expenditures for ten of the 24 accounts comprising the urban system's "Administrative" category had to be transferred in whole or in part to Reason and White categories other than "Series 100, Administration." This was relatively straightforward when the whole expenditure of an account could be transferred to a single Reason and White category, but became rather involved when part of the account expenditures needed transferring, or all of the account expenditures were transferred, but to more than one Reason and White category. This meant that budget document descriptions of expenditures for each urban system account for each of the years 1969 and 1970 (and backwards to 1965 in some cases) had to be scrutinized to establish correct re-allocations according to Reason and White definitions. This involved the detailed examination of two and sometimes three consecutive annual budget descriptions (covering some 300 pages each) of some 164 accounts.

In the case of salary accounts, even more detailed breakdown than that provided in the budget descriptions was required, and here



recourse was had to the payroll computer printouts and to various officials and clerks in the payroll, accounting, and personnel departments.

In addition, hundreds of capital accounts for the years 1968 and 1969 were examined for the sub-study on capital costs.

The urban system category labelled "Maintenance" presented a particular challenge. Not only did 23 of the 67 accounts require transferring to other than Reason and White's "Series 700, Plant Maintenance," but most accounts involved allocation to more than one Reason and White category. Furthermore, the budget document descriptions were not sufficiently detailed to assist very materially in this task. Particular difficulty was encountered in attempting to establish the salary portion of these accounts as salaries and materiel were aggregated in the budget descriptions. Recourse to the payroll printouts was not possible in this case, as an undetermined portion of the maintenance payroll was allocated to various instructional and capital accounts. To establish the payroll portion of each maintenance account precisely would require a separate study, the resources in time and money being beyond the scope of this study. Such a study would involve the detailed examination of thousands of individual work orders issued by the maintenance department during the course of the school year and a further examination of the subsequent cost allocations to those work orders. Alternatively, it would involve some method of gaining access to the information through the personnel who develop the budget descriptions and aggregate data for this set of accounts.

It is interesting to note that the budget descriptions for the urban system's "Maintenance" category are program-based, but lack object detail on salaries and supplies for their programs.



## V. DEVELOPMENT OF A FUNCTIONAL COST STRUCTURE

A cursory examination of some possible cost structures (Dade County, 1970; Evans, 1954; Hagen, 1968; Hartley, 1968) will reveal that there are as many cost structures as there are people to sit down and think them up. Although it could be argued that the cost structures chosen for the final display of information for this study (illustrated in Figures 1c and 1d) are not significantly different from the Reason and White functional-character-object categories, they do display the information in such a way that cost relationships are more apparent. In addition, such non-function Reason and White categories as the 800 Series, Fixed Charges, are distributed to the appropriate functions in the suggested cost structures. The grid or matrix in Figure 5 illustrates the relationship of the conventional functional-character categories to the implementary functions utilized in this study. (See Table XII in Chap. V for details.)

The cost structures adopted for this study relate to the vehicle (i.e., the Reason and White functional-character categories) used for the whole series of studies, and yet allow for a more meaningful display of information, a more apparent relationship of costs, and the inclusion of subsidiary information on support services such as pupil transportation, guidance, special education, and audio-visual services.

In addition to the functional cost structure developed for current expenditures, a separate cost structure was developed for capital expenditures on school plant. The structure, illustrated in Figure 6, includes these cost components:

- (a) the construction costs of the unfurnished building,
- (b) equipment and furnishings costs,
- (c) site acquisition costs, and
- (d) site development costs.





Functional-Char. Categories	IMPLEMENTARY FUNCTIONS						Totals
	General Implementary		Physical Plant Implementary				
	Support Services	Admin.	Maint.& Repairs	Operation	Debt Service	Capital from Curr.Rev.	
100 Admin.		X					
200 Instr.	X						
300 Attend.							
400 Health							
500 Transp.	X						
600 Pl.Oper.				X			
700 Pl.Maint.			X				
800 Fixed Ch.	X	X	X	X	X		
900 Food							
1000 Stu.Act.							
1100 Com.Ser.							
1200 Capital						X	
1300 Debt Ser.					X		
1400 Transfer							
Totals							

FIGURE 5

GRID: IMPLEMENTARY FUNCTIONS BY CONVENTIONAL

FUNCTIONAL-CHARACTER CATEGORIES



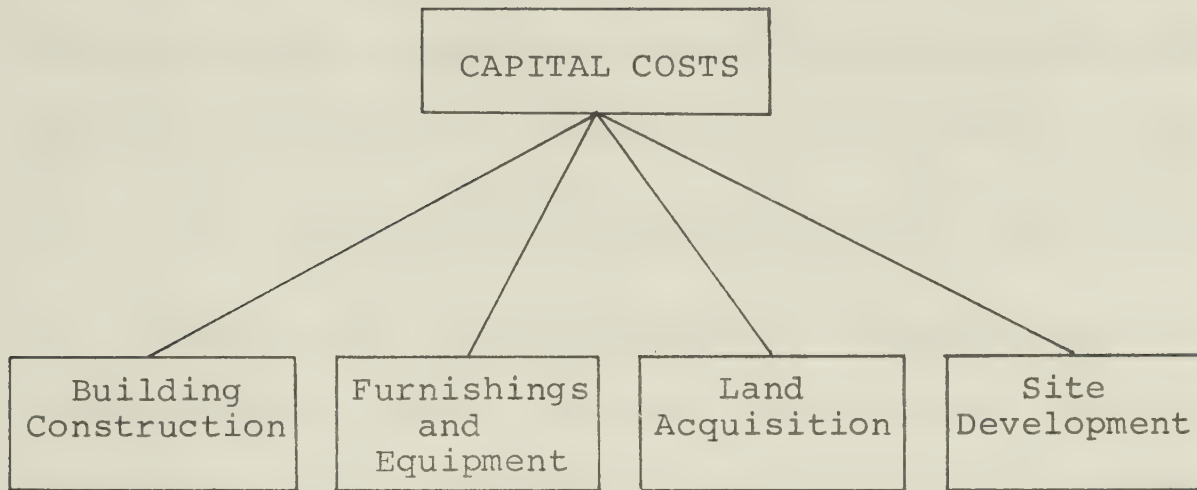


FIGURE 6

CAPITAL EXPENDITURES COST STRUCTURE



An attempt was then made to relate these two cost structures (current and capital) by computing per pupil costs for capital expenditures in terms of the repayment of principal and interest over a 20-year period. These could be compared to the functions of debt service and Capital from Current Revenue in the current expenditure cost structure. The additional data provided by the capital cost structure provided comparative information relative to these two often-neglected functions.

## VI. AUXILIARY DATA AND COMPUTATION OF UNIT COSTS

The auxiliary data was chiefly that of number of pupils, in connection with the current expenditure cost structures. This was usually the number of enrolled system pupils, although in the case of special education and some other areas an attempt was made to cost on a per client pupil or per pupil served basis also. In the capital expenditures sub-study, the auxiliary data was square footage, cubic footage, number of teaching stations, and number of pupils (either enrolled or theoretical).

In both cases, once such auxiliary data was obtained from appropriate central office officials, the aggregate cost data already developed was divided by the appropriate auxiliary data to yield a unit cost. These unit costs were displayed using the vehicle of the Reason and White functional-character-object categories, as well as the cost structures developed for this study, both for current and capital expenditures.

The average of actual enrolments, as reported monthly by system personnel, was taken as the number of pupils enrolled in the urban system for the 1969-70 school year. The average of actual enrolments for the months of September, November, December, February, and April was the figure used in this study. The average enrolment in the elementary school





grades (1 to 6) was 38,031; the average enrolment in the junior high school grades (7 to 9) was 16,947; the average enrolment in the senior high school grades (10-12) was 16,763; the average enrolment of special education students attending classes in system-owned facilities in all grades was 1,043, making it a grand total of 72,784 system pupils. Excluded from the expenditure data in the Reason & White series and the functional categories developed in this study was: the average enrolment of 400 special education students attending classes in non-system-owned facilities, and the average enrolment of 157 kindergarten students not included in this study. Special education students and expenditures related thereto are discussed in the second to last section of Chapter V.



## CHAPTER V

### ANALYSIS AND FINDINGS

#### I. ANALYTICAL PROCEDURES

Because of the integrated nature of the four studies in this project, there was some overlap both in the collection and analysis of data. All of the expenditures for a selected sample of schools were collected, and determined to be instructional or implementary in nature. These expenditures, through direct assignment or proportionate allocation, were attributed to instructional units such as programs, and the unit costs were derived at these and other levels. This involved the re-arrangement of the total expenditures for the purpose of generating unit costs. In the case of the implementary costs investigated in this study, unit costs were derived for three component areas (physical plant, administration, and supportive programs) and for subunits of these. (See Figures 1c and 1d in Chapter I for subunit designations.)

The analytical procedures in this study were not statistical in nature; they were primarily computational. The basic outputs followed the questions raised in Chapter I, namely, implementary costs per system pupil for the various functions and programs identified in the "Specific Sub-Problems" listed.

In summary, the basic computational output includes:

1. Current expenditure per pupil costs for the conventional Reason and White functional-character-object categories.
2. Current expenditure per pupil costs for the functional cost structures developed for this study, as illustrated in Figures 1c and 1d, in Chapter I.



3. Capital expenditure per pupil costs for the capital cost structure developed for the study. (See Figure 6, Chapter IV.)

## II. CENTRAL OFFICE AND UNALLOCATED-TO-SCHOOLS EXPENDITURES

### (REASON AND WHITE CATEGORIES)

#### Expenditures on Central Office Administration

Using the Reason and White series of expenditure accounts, with the sub-categories adapted for this study, the central office administrative costs were broken down into three categories: salaries, contracted services, and other expenses. These and the sub-categories of each are detailed in Table I, Expenditures on Central Office Administration.

Administration for central office consists of those activities which have as their purpose the general regulation, direction, and control of the affairs of the school district that are system-wide and not confined to one school, subject, or narrow phase of school activities.

Expenditures such as those for the administration of a high school by a principal (see other researchers) or the supervision of a particular subject area throughout the system were expenditures charged to the 200 Series, Instruction. Expenditures for the administration of transportation, food services (See Duke study), and student-body activities (see Duke study) were recorded under the accounts for those activities. In summary, school administration and subject area supervision expenses do not occur under this administration category.

The grand total of expenditures for Central Office Administration was \$2,536,450, comprised of salaries (\$1,940,106), Contracted Services (\$67,345), and Other Expenses (\$528,999). Detailed description follows.





TABLE I  
EXPENDITURES ON CENTRAL OFFICE ADMINISTRATION

100 Series

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110. SALARIES		
110-a. Board of Trustees	\$ 28,966	
110-b. Board Secretary-Treasurer's Office	39,667	
110-c. School Trustees' Elections	----	
110-d. Tax Collection	----	
110-e. Legal Services	----	
110-f. Superintendent's Office	265,322	
110-g. Personnel Office	330,153	
110-h. Public Relations	14,523	
110-i. Centralized Research	82,856	
110-j. Census Enumeration	65,049	
110-k. Office of Business Admin.	54,139	
110-l. Fiscal Control	278,444	
110-m. Bldgs., Grounds, & Materiel	700,892	
110-n. Printing & Publishing	25,115	
110-o. Other Salaries for Admin.	55,000	
TOTAL		\$1,940,106
120. CONTRACTED SERVICES		
120-a. School Trustees' Elections	32,000	
120-b. Legal, Audit, & Special	35,345	
TOTAL		67,345
130. OTHER EXPENSES		
130-a. Board of Trustees	43,596	
130-b. Personnel Office	36,988	
130-c. Public Relations	7,000	
130-d. Centralized Research	27,114	
130-e. Census Enumeration	83,721	
130-f. Fiscal Control	100,389	
130-g. Miscellaneous Expenses	230,191	
TOTAL		<u>528,999</u>
GRAND TOTAL, ADMINISTRATION		<u><u>\$2,536,450</u></u>

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Under Salaries, the Board of Trustees expenditure (\$28,966) represents payments to the 7 elected officials of the school district. The Board Secretary-Treasurer's Office expenditure (\$39,667) represents the combined salaries of the board secretary, the secretary-treasurer, and clerical assistance. An arbitrary breakdown between the secretary's office, and the secretary-treasurer's office would be \$13,823 and \$25,844 respectively.

There are no staff salaries chargeable to School Trustees' Elections and Tax Collection as both of these functions are carried out by the municipal government for the area in which the school district is located. Charges are levied by the municipal government for a portion of the expenses of municipal elections, of which the school trustees' elections are a part. These are noted under contracted services in Table I. Similarly, there are no Legal Services expenditures; these are also charged under contracted services in Table I.

Expenditures for the Superintendent's Office (\$265,322) included the salaries for the staff responsible for the educational leadership of the district. This included the superintendent himself, the deputy superintendent, the assistant to the superintendent, and several associate superintendents responsible for curriculum, educational administration, and guidance services (but excluding the associate superintendent in charge of business administration), plus the secretarial and clerical assistance for these top officials. Included were the superintendent's immediate office salaries (\$120,800), curriculum administration (\$53,175), educational administration (\$54,399), and guidance services administration (\$26,948), plus a pro-rated budgeted expense of \$10,000 for new positions for 1970.



Public Relations expenditures (\$14,523) included the salary of a public information officer and the clerical assistance for his office. The salaries for Centralized Research (\$82,856) include those personnel who are responsible for planning and conducting research studies for the district as a whole, including secretarial and clerical salaries for such purposes. Testing programs carried on in individual schools in connection with the instructional program were not recorded here; they were recorded under the 200 Series, Instruction. Salaries for Census Enumeration (\$65,049) comprised a 50% pro-ration of the salaries of those in the information system section of central office. The somewhat arbitrary one-half of these salaries was indicated as a reasonable pro-ration by the official heading up this section. The other 50% of these salaries were charged to Fiscal Control.

Salaries of the Office of Business Administration (\$54,139) included the salaries of the associate superintendent in charge of this section as well as his assistant, and the secretarial and clerical assistance related to his immediate office. Salaries for Fiscal Control (\$278,444), included the comptroller, the principal accountants, supervisors of accounts, accountants, and internal auditors responsible for controlling the financial operations of the school district, including salaries of account clerks, bookkeepers, and other clerical personnel whose activities related to fiscal control. This also included a 50% pro-rated portion (\$65,049) of salaries of personnel in the information system section, as noted above under Census Enumeration expenditures.

Expenditures for Administration of Building, Grounds and Material (\$700,872) included salaries of central office personnel who administer the system-wide plant construction, operation, maintenance,





and purchasing programs. Also recorded here were salaries of draftsmen who were on the payroll of the school district and not assigned to specific construction projects. Salaries of supervisors of custodial or maintenance forces for individual buildings or groups of buildings (less than the entire system) within the system, and operation and maintenance of the central office administration buildings were not recorded under this account. Such salaries were recorded under the 600 Series, Operation of Plant, and the 700 Series, Maintenance of Plant. Expenditures incurred for construction projects including salaries and expenses of school district personnel employed for or assigned to such projects were not recorded here.

Some of the sub-sections recorded under Administration of Buildings, Grounds and Materiel were: the system-wide administration of school facilities construction, excluding school equipment (\$275,998), administration of school equipment (\$121,526), and administration of maintenance (\$219,848). Purchasing office salaries (\$73,500) included the full-time, part-time and pro-rated portions of salaries of purchase agents and other administrative personnel responsible for the system-wide purchasing, storing and dispensing of school supplies and materiel including secretarial and clerical salaries for this purpose. Salaries of supervisors of warehouses, stock clerks, shipping clerks and other personnel who operated central store rooms were not recorded here; they were recorded under Operation of Plant.

Salaries for Printing and Publishing included those for services rendered in connection with the printing or publication of annual reports, proceedings of the board of trustees, the school directory, board manuals, and any other administrative publications of the school districts.



Expenditures for publications used for school functions, and for forms were not recorded here; they were recorded in the appropriate accounts according to the purpose for which they were purchased. Charges here (\$25,115) were for central office duplicating services, copying services, etc.

Other Salaries for Administration (\$55,000) included other office services such as switch board, mail room, etc. (\$20,000), plus extra administrative expense as a result of illness or overtime (\$35,000).

Contracted Services for administration included expenditures for administrative services rendered by personnel who were not on the payroll of the school district, including all related expenses covered by the contract. School Trustees' Election expenditures (\$32,000) represent a pro-rated portion of the municipal-school election expenses incurred by the municipal government while conducting the concurrent elections. Legal, audit, and other special services (\$35,345) relate to legal advice and legal documents, and external auditing expenses.

Other Expenses for administration were those incurred by district employees in connection with the system-wide administration of the school district's affairs. This included such items as supplies, travel expenses, rental of equipment, and administrative in-service training. Board of Trustees expenses (\$43,596) included convention expenses (\$5,596) and trustees' association dues (\$38,000). Other expenses for the personnel office (\$36,988) included advertising expenses (\$17,676) and recruiting expenses (\$19,312). Other expenses for public relations (\$7,000), included new school openings and meet-the-teachers nights. Other expenses for centralized research (\$27,114), included expenses for supplies, etc., for various projects. Other expenses for school census enumeration and



student scheduling (\$83,721) represented data processing costs for those activities. Other expenses for fiscal control (\$100,389) included data processing (\$83,772) and system costs related to budgeting (\$16,667). Other miscellaneous expenses (\$230,191) included postage (\$26,378), stationery and office expense (\$122,061), transportation (\$33,575), conventions and travel expense (\$27,602), sundry dues and grants (\$6,534), and miscellaneous (\$14,041).

#### Expenditures on Instruction

Instruction for the 200 Series of the Reason and White expenditure accounts consists only of those activities dealing directly with or aiding in the teaching of students or improving the quality of teaching. These are activities of the teacher, principal, consultant or supervisor of instruction, and guidance and psychological personnel. This would normally also include expenditures for supplementary educational media.

However, Table II, Expenditures on Instruction, 200 Series, included only the central office and unallocated-to-schools expenditures related to instruction. Thus, salaries of principals, classroom teachers, school librarians, school audio-visual personnel, school guidance personnel, and expenses relating to school teaching supplies, school libraries, school audio-visual centers, and/or instructional materials centers are excluded. These were costed by other researchers. Central office expenses for library and audio-visual services, however, were included, as were salaries for teacher-interns and salaries relating to classroom teachers involved with instructional improvement projects. The grand total of salaries and materiel in this Series, as detailed in Table II was \$3,445,118, of which \$2,602,156 was salaries and \$842,962 was materiel.





TABLE II  
EXPENDITURES ON INSTRUCTION<sup>a</sup>

200 Series

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210. SALARIES		
210-a. Substitute Teachers (Temporary, not "built-in")	\$465,124	
210-b. Curriculum Supervision	458,158	
210-c. Centralized Library Services	201,273	
210-d. Centralized AV Services	63,914	
210-e. Centralized Guidance & Psychological Services	822,129	
210-f. Teacher-Interns	60,723	
210-g. Sabbatical Leave	260,000	
210-h. Miscellaneous Leave	170,835	
210-i. Instructional Improvement Projects	100,000	
TOTAL		\$2,602,156
220. TEXTBOOKS (chiefly binding)		11,911
230. CENTRALIZED LIBRARY & AV MATERIEL		
230-a. Library Materiel	115,952	
230-b. AV Materiel	112,292	
TOTAL		228,244
240. TEACHING SUPPLIES		
240-a. Unallocated to Schools	36,372	
240-b. Tests & Measure. Supplies	6,237	
TOTAL		42,609
250. OTHER EXPENSES		
250-a. Curriculum Materiel	262,286	
250-b. Guidance, Psychological Materiel	33,452	
240-c. Curriculum Travel Expenses	170,426	
TOTAL		<u>560,198</u>
GRAND TOTAL, INSTRUCTION		<u><u>\$3,445,118</u></u>
<hr/>		

<sup>a</sup>Central office and unallocated-to-schools expenditures only in this table; normally, all instructional costs would be included in this series; such costs were analyzed by other researchers in the urban project but a gross figure for school-level expenditure is provided in Table X.



Under Salaries, the expenditure for substitute teachers (\$465,124) included only "temporary" substitute teachers, generally at the elementary or junior high level, substituting for regular classroom teachers for variable lengths of time. Excluded were costs of "built-in" substitute teacher systems, generally involved at the high school level. This latter system involves a proportion of available time for each of the teachers on staff so that they may fill in if any of their colleagues are absent. For an analysis of costs relative to this system of substitutes, see Duke (1970).

Expenditures for Curriculum Supervision (\$458,158) included the salaries of system-wide subject area consultants and supervisors and their clerical and secretarial staff. Excluded were school-level subject area specialists, supervisors, or department heads. Salaries of centralized library services (\$201,273) and audio-visual services (63,914) included central office library and audio-visual consultants and their secretarial and clerical staffs, but excluded such personnel located in schools. Likewise, salaries for Centralized Guidance and Psychological Services (\$822,129) included only those expenditures of central office personnel. Guidance counsellors located in schools were specifically excluded and were costed by other researchers.

The Centralized Guidance and Psychological Services of the school system in this study consisted, broadly speaking, of two sections: (a) a counselor-centered section relating to the on-going guidance counselling program in the schools for staff and students and the regular testing associated with that program, and (b) a student-centered section which focused primarily on a clinical approach to diagnosis and remediation for specific students. The first section related chiefly to junior



and senior high schools and the second appeared to focus more heavily on the elementary grades. The first section was clearly a guidance function, where the second section was involved with activities relating not only to guidance but to special education needs of the system. It is difficult to determine where guidance leaves off and special education begins. One official suggested that the child-centered section was concerned primarily with assessment and placement of the child, whereas special education involved itself with the actual program for the youngsters requiring it.

In any event the student-centered section of the centralized guidance and psychological services consisted of remedial specialists of various kinds, such as reading specialists, speech therapists, psychometrists, psychologists, and social workers. In addition, a medical doctor was available to this section for consultation one half-day per week. This cost was included in this Series rather than in the Reason & White Series labelled Health Services since the amount was negligible. Also included here was the clerical and secretarial assistance for these guidance, psychological and remedial personnel.

An alternative would have been to charge a portion of the expenditures for the student-centered section to Health Services, where the activities of such personnel related more directly to mental health or to the psychological problems of students or to neurological problems whether related to special education or not. This alternative was not chosen in this study. All such centralized services, whether related to general guidance or to specialized psychological services or to instructional services (reading specialists) were charged under the 200 Series Instruction, since that appeared to coincide more closely with the Reason and White classification intent. It would appear that Reason and White





confines the Health Services category to physicians, dentists, school nurses, school dental hygienists, school optometrists, school audiometrists, school psychiatric social workers, therapists, and other such personnel in the field of physical and mental health. Whether a speech therapist would belong in this mental health category, or under Instruction as one of the psychological personnel, or as a support staff member relating to a language arts program is a moot point. The same might be said of the reading specialist.

Where special education would fit in the Reason and White series is unclear. For purposes of this study special education was treated as being mainly at the school level and hence costs were not analyzed in this initial tabulation in the Reason and White Series. However, a separate report on special education was done later and was included in the second to last section of this chapter for clarification and further explanation of this area.

Expenditures for teacher-interns (\$60,723) involved payments to what might be termed pre-service teachers. University graduates would work under the direction of a full-fledged teacher for a May-June internship period before going on staff in the fall of that year. Only a fraction of the beginning teachers were involved in this teacher internship program.

Expenditures for sabbatical leave (\$260,000) and expenditures for various other kinds of leave (\$170,835) amount to a "fringe" benefit which could be costed back to the salaries (both administrative and instructional) of the persons involved. Primarily this would be instructional. This was not done in this study.

Instructional Improvement expenditures (\$100,000) involved



expenditures for extra time, substitute time, and release time for teachers involved with particular projects relating to the improvement of curricular programs.

The major cost of ~~text~~books were allocated to schools and hence are not included in Table II. Unallocated expenditures (\$11,911) included \$10,413 for book binding and \$1,498 for some unallocated textbooks.

Expenditures for Centralized Library and Audio-Visual materiel (\$228,244) included separate expenditures for library materiel (\$115,952) and audio-visual materiel (\$112,292).

Teaching Supplies (\$42,609) included tests and measurement supplies (\$6,237) and unallocated-to-schools expenditures (\$36,372).

Other Expenses under the Instructional Series (\$560,198) included curriculum materiel (\$262,286), guidance and psychological materiel (\$33,452), travel expenses for curriculum consultants (\$94,034). This latter expenditure included centralized curriculum consultants (\$69,189) and school-based teacher specialists (\$24,845) in connection with their subject area specialist duties.

Miscellaneous other expenses (\$170,426) in the 200 Series, Instruction, included expenditures for unallocated general classroom and office equipment (\$22,770), student awards (\$34,116), subject area bursaries (\$12,225), field trips (\$2,950), and grants to an educational television agency external to the school system (\$98,365).

Thus, again, the grand total for central office and unallocated-to-schools expenditures for Table II was \$3,445,118.

#### Attendance and Health Services

No specific charges were readily allocable to Attendance Services



but it could be argued that a proportion of various principals' and teachers' time should be allocated to this category. This was not done in this study.

With respect to Health Services, in the main they were carried out by the public health service and were not charged to the urban school system. The only exception was a medical doctor consultant who came in one half-day per week for consultation at the central office psychological services section. The negligible amount involved was included in the expenses for that section under the Reason and White 200 Series, Instruction. Also charged to that section were salaries of psychologists, which could have been charged to this Series, Health Services, if one wished to include them in a mental health category.

#### Pupil Transportation

The entire expenditure (\$874,584) was paid on the basis of contracted services and payments to public carriers as indicated in Table III. An estimated breakdown of this amount consists of \$489,768 paid for contracted "yellow bus" service, \$332,341 paid for regular public carrier bus transportation, and \$52,475 paid out in allowance to parents and others for transporting handicapped youngsters.

The actual number of students transported was apparently not well-documented for the 1969-70 school year under study. Estimates ranged from a low of 9,684 to a high of 11,159, excluding the handicapped students transported privately. A "best estimate" of 10,660 was established for this study. This was obtained by averaging the September, 1969, and March, 1970, estimate provided by what this investigator considered to be the most knowledgeable official on the subject in the urban system under study. The numbers were difficult to estimate





TABLE III  
EXPENDITURES ON PUPIL TRANSPORTATION SERVICES  
500 Series

510. CONTRACTED SERVICES AND PUBLIC CARRIERS	\$874,584
GRAND TOTAL, PUPIL TRANSPORTATION	<u>874,584</u>



for two main reasons: (a) monthly bus passes were issued free to the students eligible for public carrier service and there was no practical way of determining whether, or when, such passes were utilized, and (b) bus use fluctuated, depending on the season and weather.

#### Operation of Plant

Operation of Plant consisted of the housekeeping activities concerned with keeping the physical plant open and ready for use. It included cleaning, disinfecting, heating, lighting, communications, power, moving furniture, handling stores, caring for grounds, and other such housekeeping activities as were repeated somewhat regularly on a daily, weekly, monthly or seasonal basis. Operation of Plant did not encompass the repairs and replacements of facilities and equipment.

Only central office and unallocated-to-schools expenditures were categorized and entered in Table IV, Expenditures on Operation of Plant. Normally all operation of plant expenditures would be included in this Reason and White Series, but school location expenditures were handled by other researchers in the urban study.

The Salaries expenditure (\$665,861) in Table IV included the central offices plant engineers and custodial inspectors (\$64,000), custodial services for the central offices and system relief (\$264,344, which included such expenses as \$29,452 for night patrol, \$112,567 for central offices custodians, and \$122,325 for custodians who were assigned as system spares). These expenditures included salaries of custodians, custodians helpers, matrons, general utility men, night watchmen, and other such personnel who sweep, clean, polish, mop, care for buildings, operate the heating and ventilating systems and perform any other housekeeping duties, for all purposes except direct expenses for Pupil



TABLE IV  
EXPENDITURES ON OPERATION OF PLANT<sup>a</sup>  
600 Series

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610. SALARIES		
610-a. Plant Engineers (C.O.) and Custodian Inspectors	\$ 64,000	
610-b. Custodial Services (C.O. & System Relief)	264,344	
610-c. Care of Grounds (C.O. & System Assignment)	37,000	
610-d. Other (C.O. & System Assign.)	300,517	
TOTAL		\$665,861
620. CONTRACTED SERVICES		
620-a. Pest Control	3,358	
620-b. Snow Removal	12,000	
TOTAL		15,358
630. HEAT FOR BUILDINGS (C.O.)		16,085
640. UTILITIES, EXCEPT HEAT (C.O.)		
640-a. Water & Sewage	3,152	
640-b. Electricity	48,733	
640-c. Telephone	53,798	
TOTAL		105,683
650. SUPPLIES, EXCEPT UTILITIES (C.O. & UNALLOCATED TO SCHOOLS)		85,355
660. OTHER EXPENSES		<u>5,247</u>
GRAND TOTAL, OPERATION OF PLANT		<u><u>\$893,589</u></u>

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<sup>a</sup>Central office and unallocated-to-schools expenditures only in the table; normally, all operation of plant expenditures would be included in the series, but school-level expenditures were handled by other researchers in the urban study; a gross figure for school-level expenditures is provided in Table X.





Transportation, Food Services, Student-body Activities, and Community Services.

Salaries for care of grounds (\$37,000) included only those personnel at central office and those who are assigned from central offices, but excludes personnel permanently located at schools. Activities involved here were for the care of grounds (not repair and upkeep). Personnel performed such duties as: rake, hose, water, cut and protect lawns; transplant, trim and care for shrubbery and sodded play areas; prepare plants and care for flower beds; and remove snow.

Expenditures for Other Salaries (\$300,517) again included only central offices personnel and those system personnel working out of central office. Included were salaries of telephone switchboard operators (for the maintenance and operation central office only; the switchboard operator for the education administration central office was included under Other Salaries for Administration), truck drivers, elevator operators, supervisors of warehouses, stock clerks, and other such personnel who operate a central storeroom, secretarial and clerical assistance for plant operational personnel, and any other plant operation personnel whose salaries could not be charged elsewhere. Included here are such amounts as \$95,189 for warehouse management and stores, \$83,729 for trucking, \$6,806 for water treatment, \$39,893 for additional labour charges related to trucking (delivery and relocation of equipment and supplies in existing schools and the moving of equipment and supplies into new schools), and \$74,900 for overtime and statutory holidays.

Contracted Services expenditures (\$15,358) included \$3,358 for pest control and \$12,000 for snow removal.

Heat for the central offices buildings amounted to \$16,085. All



other utilities, excluding heat, totalled \$105,683, with the breakdown as follows: \$3,152 for water and sewage, \$48,733 for electricity and \$53,798 for telephone.

Expenditures for Supplies (\$85,355) included only central office supplies and unallocated-to-schools supplies. Included in this category in general, were expenditures for such custodial items as brooms, mops, soap, wax, dusters, electrical fuses, electrical light bulbs, paper towels, paper cups, toilet paper, and other such custodial supplies used by students and/or district employees. Specifically included here were such expenditure items as \$41,833 for lamps and bulbs, \$2,747 for central office custodial supplies and \$13,099 for additional supplies for the system, unallocated-to-schools. Also included here was \$6,400 for gasoline and lubrication for the trucking operation, \$857 for gasoline for lawn movers, snow removers, etc., and \$20,419 for water treatment chemicals.

Other Expenses for Operation of Plant (\$5,247) involved only the pro-rated portion of transportation allowance attributable to personnel involved with operation of plant.

Grand total, then, for the Operation of Plant expenditures was \$893,589, which excluded a considerable expenditure at the school level. This additional expenditure was added later (see Table X), to provide a more complete cost picture for operation of plant.

#### Maintenance of Plant

Maintenance of Plant consists of those activities that are concerned with keeping the grounds, buildings, and equipment at their original condition of completeness or efficiency, either through repairs or by replacement of property (anything less than replacement of a total building).



Recorded under this group of accounts were all current expenses for maintenance of plant for the school system, except direct expenses for maintenance of instructional equipment, for pupil transportation, food services, student-body activities, and community services. This included school plants, central administration offices, warehouses, garages, and maintenance shops.

Table V details expenditures for Maintenance of Plant. Total expenditures for Salaries (\$1,088,202) included \$72,131 for Repair and Upkeep of Grounds, \$839,005 for Repair and Upkeep of Buildings, \$23,556 for Repair and Replacement of Non-instructional Equipment, and \$153,510 for Holiday Pay relating to all of these salaries.

The Repair and Upkeep of Grounds included such activities as repairing and replacing walks, fences, tennis courts, playground services, lawn sprinkling systems, outside flag poles, driveways, sewers and irrigation ditches; and regrading sites, re-seeding lawns, and replacing shrubs. Expenditures for the initial grading of sites for new buildings or additions to buildings, initial seeding of lawns, initial planting of shrubs, and initial installation of walks and fences were not recorded here. They were included in the capital expenditures study at the end of this chapter.

Examples of the kinds of salaries recorded under upkeep of buildings were: re-painting woodwork, re-decorating walls, re-surfacing and re-finishing floors, re-shingling, re-painting ceilings, repairing foundations; repairing and replacing doors, windows, hardware, gutters, downspout, window glass, window shades, stage curtains, drapes and built-in equipment such as lockers, cabinets, wardrobes, venetian blinds, swimming pool filtration equipment, soap and towel dispensers, bulletin





TABLE V  
EXPENDITURES ON MAINTENANCE OF PLANT<sup>a</sup>

700 Series

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710. SALARIES		
710-a. Repair & Upkeep of Grounds	\$ 72,131	
710-b. Repair & Upkeep of Buildings	839,005	
710-c. Rpr. of Non-Instructional Equipment	23,556	
710-d. Other (Holiday Pay for Above)	153,510	
TOTAL		\$1,088,202
720. MATERIEL AND OTHER EXPENSES		
720-a. Repair & Upkeep of Grounds	19,963	
720-b. Repair & Upkeep of Buildings	674,849	
720-c. Repair & Replacement of Non-Instructional Equipment	48,114	
720-d. Other (Transportation Allow.)	47,229	
TOTAL		<u>790,155</u>
GRAND TOTAL, MAINTENANCE OF PLANT		<u><u>\$1,878,357</u></u>

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<sup>a</sup>All expenditures for the system are included here, except maintenance of instructional equipment.



boards and door checks; moving portable structures; and the maintenance of service systems which consist of the repair and replacement of such things as: boilers, radiators and ventilating ducts; electrical lighting systems, bells, clocks and inter-communication systems; sewers, toilets, fountains, water pipes, tanks and bathroom furnishings; fire plugs, fire hoses, fire sprinkling systems, fire escapes. Specific expenditures included here were: \$15,000 for contingencies such as hail and water damage, \$30,000 for vandalism, \$40,000 for moving portable classrooms, \$25,000 for building modifications, \$50,000 for general repairs to buildings such as plaster, concrete, etc., and \$670,000 for numerous accounts related to the six maintenance areas: carpentry, painting, mechanical, temperature control, metal, and electrical.

The expenditures for Material and Other Expenses (\$790,155) included \$19,963 for the Repair and Upkeep of Grounds category, \$674,849 for the Repair and Upkeep of Buildings category, \$48,114 for the Repair and replacement of non-instructional equipment category, and \$47,229 for transportation allowances relating to these categories. Included in the Repair and Upkeep of Buildings category (\$674,849) were such specific expenditures as \$12,551 for materiel in connection with hail and water damage, \$33,454 for vandalism, \$6,873 for materiel used in connection with moving portable classrooms, \$25,405 for materiel used in building modifications, \$43,455 for materiel related to general repairs, and \$533,563 for materiel related to numerous accounts in the six maintenance areas of carpentry, painting, mechanical, temperature control, metal, and electrical. Descriptions of these accounts were detailed and were not included here.



### Fixed Charges

Fixed Charges were expenditures of a generally recurrent nature which were not readily allocable to other expenditure accounts. These Fixed Charges expenditures (\$1,293,274) are detailed in Table VI under three broad heads: School District Contributions to Employee Retirement (\$697,115), Insurance (\$548,885), and Interest on Current Loans and Exchange on Foreign Purchases (\$47,274). This table is relatively self-explanatory. It included pension payments made by the district on behalf of non-teachers (\$350,200), and the Canada Pension Contributions for teachers (\$346,915). Insurance included \$83,708 for property insurance, and \$465,177 for employee insurance. This latter expenditure included such items as expenditures for life insurance coverage of employees, workman's compensation, and any other sickness or accident coverage of personnel employed by the school district. Also included here were any expenditures made in lieu of employee insurance. Specific expenditures here involved such amounts as \$78,552 for workman's compensation for maintenance and operation personnel, \$47,500 for additional compensation and sick pay for the maintenance personnel, \$71,760 for medical, hospital, and life insurance for the maintenance and operation personnel, \$28,453 for medical, hospital, and life insurance for teachers.

### Food Services

Expenditures for the 900 Series, Food Services, were not included in this study, but for details on this expenditure category see Duke (1970). His summary (page 99) indicates that these expenditures were related primarily to the senior high school student population and amount to \$3.50 per enrolled senior high school student. If Duke's sample can be considered to be representative of the total senior high school population in the urban system, then the aggregate expenditure for Food





TABLE VI  
EXPENDITURES ON FIXED CHARGES  
800 Series

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810.	SCHOOL DISTRICT CONTRIBUTIONS		
	TO EMPLOYEE RETIREMENT		
	810-a. Non-Teachers (L.A.B. & C.P.P.)	\$350,200	
	810-b. Teachers (C.P.P.)	346,915	
	TOTAL		\$ 697,115
820.	INSURANCE		
	820-a. Property Insurance	83,708	
	820-b. Employee Insurance	465,177	
	TOTAL		548,885
830.	INTEREST ON CURRENT LOANS AND EXCHANGE		
	ON FOREIGN PURCHASES		<u>47,274</u>
	GRAND TOTAL, FIXED CHARGES		<u><u>\$1,293,274</u></u>

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Services could be considered to be \$58,670 for the 16,763 senior high school students enrolled. This amounts to a relatively insignificant 85¢ per system pupil.

#### Student Body Activities

These expenditures also were not rigorously investigated for this study and so were not included. For general information purposes, such expenditures were estimated to be in the order of \$29,526 or 88¢ per junior and senior high school pupil involved in the populations to which this expenditure applies. This amounts to a relatively negligible 41¢ per system pupil.

#### Community Services

The 1100 Series, Community Services, in the Reason and White expenditure accounts, would normally include expenses related to students resident within the school system boundaries, but not part of the regular school system population. This would include students under detention or custodial care, or students in schools that are not part of the public school system. Possible expenditure items here could be the \$110,000 expended by the urban system in 1969-70 for salaries for teachers of those temporarily home-bound or hospitalized but these were included later in this chapter in Table X, under the 200 Series, Instruction. Other possible expenditure items here could include the \$50,000 the urban system expended for salaries and supplies for an embryonic kindergarten program, the \$581,750 for salaries for teachers of 400 special education students not attending district-owned school facilities, \$216,001 for salaries for teachers of summer school, evening classes and tutorial sessions, and \$49,752 for grants to schools for the retarded (such schools not being part of the system). These latter expenditures totaled



\$897,705 or \$12.33 per system pupil. These were significant expenditures, but they could as readily be termed special education expenditures as community services. These expenditures and others are reported in the section on special education in the second to last section in this chapter.

#### Capital Outlay (Out of Current Revenue)

Capital Outlay Expenditures were those which resulted in the acquisition of fixed assets or additions to fixed assets, where these were purchased out of current operating funds. Expenditures not out of current revenue were detailed in a separate sub-study, reported in the last section of the chapter.

Expenditures out of current revenue for capital outlay (\$544,892) are detailed in Table VII and consisted of such expenditures as \$175,000 for local improvements to sites (a charge levied by the municipality in which the school district resides), \$170,000 for the portions of new buildings and additions which the provincial authority does not recognize as recoverable through debenture issue, \$154,072 for remodelling and contingencies, \$32,600 for administrative equipment and \$13,220 for plant maintenance equipment. Excluded here were capital expenditures out of current revenue for instructional equipment. These were included later in this chapter in Table X, under Instruction.

#### Debt Service

Expenditures for the 1300 Series, Debt Services (\$7,164,257), are detailed in Table VIII. Included were the two categories: repayment of principal (\$3,708,815), and interest on the outstanding debt (\$3,375,442).

#### Outgoing Transfers

No expenditures were recorded for the 1400 Series, Outgoing





TABLE VII  
CAPITAL OUTLAY<sup>a</sup>  
1200 Series

<hr/>		
1210. SITES		
1210-a. Professional Services	---	
1210-b. Sites and Site Additions	---	
1210-c. Local Improvements to Sites	\$175,000	
TOTAL		\$175,000
1220. BUILDINGS		
1220-a. Professional Services	---	
1220-b. New Buildings & Additons	170,000	
1220-c. Remodeling & Contingency	154,072	
TOTAL		324,072
1230. EQUIPMENT		
1230-a. Administration	32,600	
1230-b. Maintenance of Plant	13,220	
TOTAL		<u>45,820</u>
GRAND TOTAL, CAPITAL OUTLAY OUT OF CURRENT REVENUE ONLY		<u><u>\$544,892</u></u>
<hr/>		

<sup>a</sup>Out of current revenue only and includes all expenditures except those for instructional equipment; a report on capital expenditures not paid out of current revenue is included at the end of this chapter.



TABLE VIII  
DEBT SERVICE FROM CURRENT FUNDS  
1300 SERIES

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1310. PRINCIPAL OF DEBT		
1310-a. Debentures	\$3,708,815	
1310-b. Short-term Loans	80,000	
TOTAL		\$3,788,815
1320. INTEREST ON DEBT		
1320-a. Debentures	3,370,540	
1320-b. Short-Term Loans	4,902	
TOTAL		<u>3,375,442</u>
GRAND TOTAL, DEBT SERVICE		<u><u>\$7,164,257</u></u>

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Transfer Accounts, as this large urban district appears not to have any such. Most payments of this nature are incoming to the school district from other school districts who send students to the urban district.

### Summary of Expenditures

Table IX, Summary of Expenditure Accounts, summarizes the expenditures for the major categories of the Reason and White series. Included are only those expenditures which relate to the major thrust of this study, which was to extract and categorize central office and unallocated-to-schools expenditures. Although system pupil expenditures were computed also, and included in Table IX, it must be noted that this provided a somewhat limited view if a picture of total expenditures is desired. For example, the 200 and 600 Series, Instruction and Operation of Plant, included only central offices and unallocated-to-schools expenditures. Direct and indirect instructional costs were excluded. Also excluded were expenditures for maintenance of, and capital expenditures for, instructional equipment.

### III. TOTAL SYSTEM EXPENDITURES (Reason and White Categories)

Table X provides a complete system summary of expenditure accounts for the Reason and White series. This remedies the limited view in Table IX by providing, in addition to the central offices and unallocated-to-school expenditures, those expenditures which were allocated to schools. School costs in general were investigated by the other researchers in the urban study, but they investigated only a small sample of schools in the urban system under study, and since their data was not generalizable to the total system, this study obtained total system costs for these areas. These obtained total costs were estimated aggregate budgeted amounts only, selected actual expenditure breakdowns being available in





TABLE IX  
SUMMARY OF EXPENDITURE ACCOUNTS  
(Partial Costs Only for Some Series)

	Aggregate Expenditure	Per System Pupil
100 Series, ADMINISTRATION	\$ 2,536,450	\$ 34.85
200 Series, INSTRUCTION	3,445,118 <sup>a</sup>	47.33
300 Series, ATTENDANCE SERVICES	---	---
400 Series, HEALTH SERVICES	---	---
500 Series, PUPIL TRANSPORTATION	874,584	12.01
600 Series, OPERATION OF PLANT	893,589 <sup>a</sup>	12.28
700 Series, MAINTENANCE OF PLANT	1,878,357 <sup>b</sup>	25.81
800 Series, FIXED CHARGES	1,293,274	17.77
900 Series, FOOD SERVICES	(See Duke Study)	
1000 Series, STUDENT-BODY ACTIVITIES	(Not Included)	
1100 Series, COMMUNITY SERVICES	(Not Included)	
1200 Series, CAPITAL OUTLAY (CURRENT)	544,892	7.49
1300 Series, DEBT SERVICE (CURRENT)	7,164,257	98.43
1400 Series, OUTGOING TRANSFER ACCOUNTS	---	---
GRAND TOTAL, ALL SERIES	<u>\$18,630,521</u>	<u>\$255.97</u>

<sup>a</sup>Includes central office and unallocated-to-schools expenditures only.

<sup>b</sup>Includes all maintenance expenditures for the system, except maintenance of instructional equipment, which is allocated to schools.



TABLE X  
SYSTEM SUMMARY OF EXPENDITURE ACCOUNTS

	Central Office & Unallocated to Schools Expenditures	School Expenditures	Total Expenditures	% of total Expenditures	Pre System Pupil Expenditure
100 Central Office Administration	\$ 2,536,459	-----	\$ 2,536,450	4.3%	\$ 34.85
200 Instruction	3,445,118	\$36,950,010 <sup>a</sup>	40,395,128	68.4%	555.00
500 Pupil Transp.	874,584	-----	874,584	1.5%	12.02
600 Operation	893,589	3,144,957	4,038,546	6.8%	55.49
700 Maintenance	1,878,357	-----	1,878,357	3.2%	25.81
800 Fixed Charges	1,293,274	-----	1,293,274	2.2%	17.77
1200 Capital (Current)	544,892	351,000 <sup>b</sup>	895,892	1.5%	12.31
1300 Debt Service	7,164,257	-----	7,164,257	12.1%	98.42
TOTAL	<u>\$18,630,521</u>	<u>\$40,445,967</u>	<u>\$59,076,488</u>	<u>100.0%</u>	<u>\$811.67</u>

<sup>a</sup>Includes approximately \$161,200 for maintenance of instructional equipment.

<sup>b</sup>Instructional equipment (excludes AV & Library materiel): new & replacement.



Duke (1970).

The School Expenditure of \$36,950,010 for the Reason and White 200 Series, Instruction, included regular classroom teacher salaries, special education salaries (but only for those personnel serving special education students in district-owned facilities - \$1,347,316), school guidance counsellor salaries (\$998,268), school audio-visual and library salaries and materiel (\$2,236,117), maintenance of instructional equipment (\$161,200), school supplies and textbooks and school administration. Also included were teacher salaries for the "temporarily" hospitalized and homebound students (\$110,000). Excluded were teacher salaries for special education students not attending classes in district-owned facilities (\$581,750), teacher salaries for summer school, evening classes, and tutorial sessions (\$216,001), and grants to retarded schools (\$49,752). The special education expenditures alluded to above, whether for students in district-owned facilities or not, are discussed in the second to last section of this chapter.

The largest expenditure in Table X, comprising 68.4% of the total system costs, was for the Reason and White Series 200, Instruction, totaling \$40,395,128 or \$555 per system pupil. The next largest single expenditure was that for the 1300 Series, Debt Service, in the amount of \$7,164,257 or 12.1% of total expenditures. This amounted to \$98.43 per system pupil. The smallest single expenditure category was that for pupil transportation in the amount of \$874,584 or \$12.02 per system pupil, comprising 1.5% of total expenditures. Total per system pupil expenditure was \$811.67.

All of the total system expenditure categories are rank-ordered in Table XI.





TABLE XI  
SYSTEM SUMMARY OF EXPENDITURES  
ACCOUNTS, RANK-ORDERED

	Total Expen- diture	% of Total Expenditure	Per Sys- tem Pupil
200 Instruction	\$40,395,128	68.4%	\$555.00
1300 Debt Service	7,164,257	12.1%	98.43
600 Operation of Plant	4,038,546	6.8%	55.49
100 Central Office			
Administration	2,536,450	4.3%	54.85
700 Maintenance of Plant	1,878,357	3.2%	25.81
800 Fixed Charges	1,293,274	2.2%	17.77
1200 Capital Outlay (Current)	895,892	1.5%	12.31
500 Pupil Transportation	874,584	1.5%	12.02
TOTAL	<u>\$59,076,488</u>	<u>100.0%</u>	<u>\$811.67</u>



#### IV. TOTAL SYSTEM EXPENDITURES IN A FUNCTIONAL FORMAT

Although most of the Reason and White expenditure categories for which cost data were obtained for this study are functional in character, the 800 Series, Fixed Charges, is not. In addition, financial information which is desired for the sub-function of special education is not specifically provided for by the Reason and White Series. Furthermore, it would appear desirable to add school-level expenditure data to the support areas of audio-visual and library services and guidance and psychological services, for which only financial data on the centralized services in these areas had initially been gathered for the Reason and White categories, and to display these sub-functions as well.

Table XII is a grid or matrix which permits the distribution of the Reason and White 800 Series, Fixed Charges, to the functional categories developed for the implementary expenditures in this study. The following expenditure items from the Fixed Charges category were transferred in their entirety to the functions designated: the Canada Pension Plan contributions (\$346,915) to the Instructional function; property insurance (\$83,708) to the Maintenance function; compensation and sick pay (\$47,500) to the Maintenance function; medical, hospital and life insurance for teachers (\$238,912) to the Instructional function; and interest on current loans (\$47,274) to the Debt Service function.

The following expenditure items were distributed from the Fixed Charges category to the functional areas in proportion to the total salary expenditures in those areas: pension contributions to the Administration function (\$105,060), to the Maintenance function (\$70,040), and to the operation function (\$175,100); Workman's Compensation to the



TABLE XII

GRID: TOTAL INSTRUCTIONAL AND IMPLEMENTARY EXPENDITURES BY  
CONVENTIONAL FUNCTIONAL-CHARACTER-OBJECT CATEGORIES

	INSTRUC- TIONAL	Totals	IMPLEMENTARY									
			Support Services					Central Office Admin.	Physical Plant			Capital from Current
			Instruc- tional Imple- mentary	Spec. Ed.	AV & Library Services	Guidance & Psycho- logical Services	Pupil Transp.		Maint. & Repairs	Opera- tion	Debt Serv.	
100 Administration		2,536,450						2,536,450				
200 Instruction		40,395,128	1,170,447	768,451	2,827,913	1,853,849						
500 Pupil Transportation		874,584					874,584					
600 Operation of Plant		4,038,546								4,038,546		
700 Maintenance of Plant		1,878,357							1,878,357			
800 Fixed Charges		1,293,274		12,817	4,101	28,119		126,588	247,702	285,883	47,274	
1200 Capital Outlay (Current)		895,892										895,892
1300 Debt Service (Current)		7,164,257									7,164,257	
TOTALS		59,076,488	1,170,447	781,268	2,832,014	1,881,968	874,584	2,663,038	2,126,059	4,324,429	7,211,531	895,892
% of Total Expenditures		100.0%	2.0%	1.3%	4.8%	3.2%	1.5%	4.5%	3.6%	7.3%	12.2%	1.5%
Expenditure /sys.pupil		811.67	16.08	10.73	38.91	25.86	12.02	36.59	29.21	59.41	99.08	12.31





Maintenance function (\$23,566), and to the Operation function (\$54,986); medical, hospital, and life insurance to the Administration function (\$21,528), to the Maintenance function (\$14,352), and to the Operation function \$35,880); Unemployment Insurance to the Maintenance function (\$8,536), and to the Operation function (\$19,917). Subsequently, the portion of the Fixed Charges that had been distributed to the instructional function, were re-distributed to the support services sub-functions of Special Education, Audio-visual and Library, and Guidance and Psychological services, in proportion to the instructional salaries contained in those areas.

The following expenditure items were distributed from the Reason and White 200 Series, Instruction, to the Instructional Implementary sub-function: substitute teachers (\$465,124), teacher interns (\$60,723), sabbatical leave (\$260,000), miscellaneous leave (\$170,000), instructional improvement (\$100,000), tests and measurement expenses plus unallocated supplies (\$42,609), student awards (\$34,116), subject area bursaries (\$12,225), field trips (\$2,950) and other unallocated general office and school equipment expenses (\$22,700).

The following expenditure items from the 200 Series, Instruction, were transferred to the Audio-visual and Library Services Sub-function: Centralized AV and Library Salaries (\$265,187), Centralized Audio-visual Materiel expenses (\$228,244), the payment to the external educational television agency (\$98,365), and the school-level audio-visual and library services salaries and materiel (\$2,236,117).

The following items of expenditure were transferred from the 200 Series, Instruction, to the Guidance and Psychological Services function: Centralized Guidance and Psychological Services salaries and materiel (\$855,581), and school-level guidance personnel (\$998,268).



The following expenditure item was transferred from the 200 Series, Instruction, to the Special Education sub-function: only that portion of costs connected with special education that were in addition to, or in excess of, costs that would have been associated with the same group of students had they been regular students. This means that not all of the salaries for special education teachers, for example, were transferred, and only the costs of special equipment required over and above the regular supplies and equipment were transferred. This and other aspects of special education are discussed in the next section of this chapter.

Table XIII summarized the functional data developed in the grid or matrix in Table XII. Note that the Instruction function does not display its administrative component (such as principal salaries) nor any other component (such as teacher salaries or supplies costs), as these components were investigated by the other researchers in the urban study. For details, see Duke (1970).

Figure 7 aggregates and diagrams the functional expenditures as originally proposed in Figure 1c in Chapter I of this study. Aggregate expenditures were based on the expenditure data in Table XIII.

Total educational costs were \$59,076,488 or \$811.67 per system pupil. This total expenditure was composed of 58.1% instructional costs (\$34,315,258) and 41.9% implementary costs (\$24,761,230), or \$471.47 and \$340.20 per system pupil, respectively.

Implementary costs in turn were composed of general implementary costs (\$10,203,319, or \$140.19 per system pupil) and physical plant implementary costs (\$14,557,911, or \$200.01 per system pupil).

General implementary costs were composed of support services (\$7,540,281, or \$103.60 per system pupil) and central office

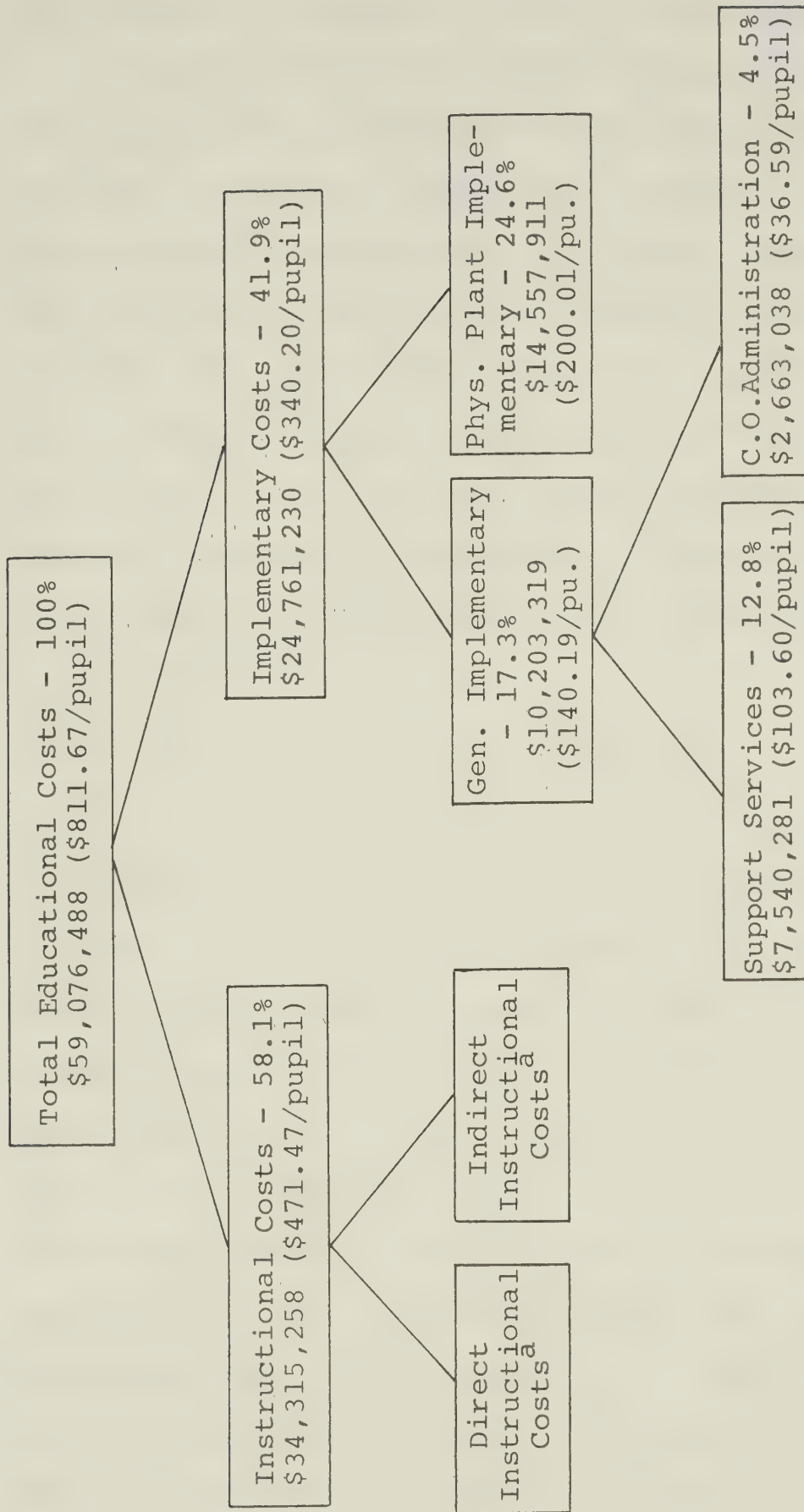


TABLE XIII  
SUMMARY OF TOTAL INSTRUCTIONAL & IMPLEMENTARY  
EXPENDITURES BY FUNCTIONAL CATEGORIES

	<u>Expenditure</u>	<u>% of Total Expenditure</u>	<u>Expenditure Per System Pupil</u>
<u>INSTRUCTION</u>			
Direct & Indirect Instruction	\$34,315,258	58.1%	\$471.47
<u>SUPPORT SERVICES</u>			
Instructional			
Implementary	1,170,447	2.0%	16.08
Special Education	781,268	1.3%	10.73
AV & Library	2,832,014	4.8%	38.91
Guidance & Psych.	1,881,968	3.2%	25.86
Pupil Transp.	874,584	1.5%	12.02
<u>ADMINISTRATION</u>			
C. O. Admin.	2,663,038	4.5%	36.59
<u>PHYSICAL PLANT</u>			
Maintenance	2,126,059	3.6%	29.21
Operation	4,324,429	7.3%	59.41
Debt Service	7,211,531	12.2%	99.08
Capital from Current Revenue	<u>895,892</u>	<u>1.5%</u>	<u>12.31</u>
TOTAL	<u>\$59,076,488</u>	<u>100.0%</u>	<u>\$811.67</u>







<sup>a</sup> See Duke (1970) for limited sample analysis of these costs.

FIGURE 7

FUNCTIONAL SUMMARY OF TOTAL  
EDUCATIONAL EXPENDITURES



administration (\$2,663,038, or \$36.59 per system pupil).

Support services were composed of instructional supplementary costs, (\$1,170,447, or \$16.08 per system pupil), special education costs (\$781,268, or \$10.73 per system pupil), audio-visual and library services costs (\$2,832,014, or \$38.91 per system pupil), guidance and psychological services (\$1,881,968, or 25.86 per system pupil), and pupil transportation (\$874,584, or \$12.02 per system pupil).

Physical plant supplementary costs were composed of operation (\$4,324,429, or \$59.41 per system pupil), maintenance (\$2,126,059, or \$29.21 per system pupil), debt service (\$7,211,531, or \$99.08 per system pupil), and capital out of current revenue (\$895,892, or \$12.31 per system pupil).

#### V. SPECIAL EDUCATION

As discussed earlier in this chapter, special education cannot be considered to be a support service except insofar as costs additional to regular teaching programs are incurred. Thus, expenditures for regular supplies, common equipment, facilities, and the normal amount of instructional time (i.e., instructional salaries) that would be made irrespective of whether the pupils were special education students or not, are not chargeable to special education. This limitation on the expenditures charged to special education is necessary to provide consistency with the other support services. For example, guidance and psychological services are an adjunct to the regular teaching program and as such have been costed in this study such that the unit cost per system pupil represents the cost of this particular additional service to particular client pupils, distributed over the entire school system student population. If the cost per client pupil were desired the situation



might be different, but per client pupil costs were not determined in this study. If the total costs of salaries for special education teachers, facilities, and materiel were distributed over the entire school system student population, the resultant cost per system pupil would not only be high, but inconsistent with the other data, since the special education client is also a regular student whose regular teaching costs should be ignored when costing this service to him, just as they were when costing guidance services to regular students.

Total special education costs in the urban system under study for this project may be divided into two broad categories: those expenditures relating to special education students attending classes in facilities owned by the urban school district, and those special education students attending classes in facilities owned by other agencies in the community, whether public or private. The latter group may be sub-divided into those for whom the urban system supplies teachers, and those for whom the system provides only financial grants. In summary, then, the urban system provides special education teachers and facilities for one group of special education students, teachers only for another group of special education students, and neither teachers nor facilities for still a third group of special education students.

Assuming that the costs of educational facilities and administrative overhead are the same for both special education students and regular students, the 1,043 special education students attending in system-owned facilities would incur the average \$256.67 per system pupil cost for such facilities and overhead, as computed in Table X. Aggregate estimated expenditures for these 1,043 special education students, in respect of facilities and administrative overhead, would then be \$267,706.





Actual expenditures for teachers' salaries and special equipment for this group amounted to \$1,347,316 in the 1969-70 school year under study for this project. Total aggregate costs for this group, therefore, were in the order of \$1,615,022, or \$1548.44 per client pupil. If this cost is distributed across the system, it amounts to \$22.19 per system pupil, but this is not a realistic nor consistent estimate of the additional costs incurred by special education students, as pointed out above. It does, in fact, include both the regular cost that would be incurred in the normal course of events in teaching such a group of students if they were not special education students, and the additional costs incurred for the group because of their being special education students.

Therefore, if the expenditure of \$846,572 (the product of 1,043 students and the average cost per system pupil of \$811.67) that would have been incurred had these students been taught as regular students is subtracted from the aggregate \$1,615,022, the net additional cost to the system is only \$768,451 or \$10.56 per system pupil. Although the per client cost is still a relatively high \$736.77, it is misleading to quote such a figure as a support service cost unless other support services are being costed on a per client basis, as pointed out above. It would be interesting to cost analyze per client costs of guidance and psychological services for example.

Only these special education "additional costs" expenditures were used in the support services function in Table XIII. The Table XIII figure is slightly higher because of the addition of a small component distributed from Fixed Charges to the special education sub-function.

In addition to the above 1,043 special education students, there were 400 special education students not attending in district-owned facilities. The gross teacher salary bill for this group was \$581,750,



which is \$1,454.38 per client pupil or \$7.99 per system pupil. Again this cost is misleading compared with other data in this study. If this group were taught as regular students the salary bill would be \$222,000 and hence the additional cost for this group of 400 students was only \$359,750, which is \$899.38 per client pupil or \$4.94 per system pupil. It could be argued that the additional cost to the urban school district is even less than this figure because they are not required to provide for facilities for this group of special education students. If this line of argument were followed, an additional presumed \$71,892 (the product of 400 students and the average cost for facilities for such students of \$179.73) that would have been paid out by the district should be subtracted from the additional costs quoted above. The additional cost would then be only \$287,858, or \$3.95 per system pupil. These 400 students were excluded from the student count when computing the number of system pupils for the urban district under study.

In addition to the special education students noted above, there were an undetermined number of students which were neither taught by district personnel nor housed in district-owned facilities. The urban district makes annual grants for one of these groups, namely retarded students. The 1969-70 grant amounted to \$49,752 or \$0.68 per system pupil. This amount does not begin to cover the costs of the student group involved.

Other expenditures which could be included as special education expenditures would be: kindergarten expenses for 157 pre-school students (approximately \$50,000 in salaries and materiel), summer school, evening classes, and tutorial sessions (approximately \$216,001 for salaries). All of these other expenditures were excluded from the expenditure data provided for the Reason and White series.

Included in the Reason and White series expenditures, Table X,



for the 200 Series, Instruction, was approximately \$110,000 for salaries for those teachers teaching "temporarily" homebound and hospitalized students. These were included since it was thought that they represented a cost related to students who are regular students to the system, but were "temporarily" (for varying lengths of time) out of the facilities of the system.

It may be of interest to note that out of the 1,043 pupils identified as special students (in system facilities) by officials in the urban system under study during the school year 1969-70, an average of 309 were enrolled in adaptation classes (learning disabilities and emotional disturbance), an average of 42 were enrolled in hearing conservation classes, an average of 675 were enrolled in opportunity classes (educable mentally retarded), and an average of 17 were enrolled in sight-saving classes.

In addition to the sight-saving classes above, there were 40 pupils registered in regular classes in the sight-saving and blind category who were not included in the above total. Two teachers were assigned specifically to these pupils.

The urban system under study had only one facility totally devoted to what has been termed special education, and this facility was chiefly for opportunity classes. The other special education classes are held in the classrooms of regular schools. As noted above, some facilities are provided by institutions such as hospitals and detention centers, and for these, the school district provide the teachers and the materiel, but the institutions themselves looked after the cost of the facilities and caretaking.

In addition to the pupil enrolments noted above, an average of 6 students were identified as special education students enrolled in





what is called an "observation class," held in connection with the centralized guidance and psychological services provided by the system. Such students, however, were relatively temporary. They came from, and returned to, either the regular system classrooms or special education classrooms. Costs were charged to centralized services.

Responsible administrative officials in the urban system under study estimated that 50% of the special education students were students whose parents were not normally resident within the boundaries of the school district. The accuracy of this estimate is unknown.

To what extent some expenditures for centralized psychological and guidance services could be pro-rated and charged to special education was not determined in this study. It would be interesting to cost not only the per client expenditure of the centralized guidance and psychological services, but to determine accurately which of those clients could be described or identified as special education students, and the per client cost of these students as opposed to the "regular" students.

## VI. CAPITAL EXPENDITURES

### Introduction

Up to this point, this study has confined itself solely to the operational expenditures of the urban system under study. However, it was deemed appropriate and useful for comparative purposes to study actual capital expenditures in addition to simply showing the effect, or the relative importance of, the debt service component in operational expenditures. Reliable data were not available for the school year 1969-70 relative to capital expenditure, and in addition it was felt that a two year period provided a better picture than just a single year. Accordingly, the two calendar years 1968-69 were chosen since reliable data



could be obtained for those years and they were sufficiently close chronologically to the 1969-70 school year used for the study of operational expenditures that dollar figure comparisons would be relatively more meaningful than had a much earlier period of time or a much longer period of time been chosen. In other words, the effect of inflation on the relative values of the dollar figures indicated for the capital expenditure study and the operational costs study would be relatively small.

The study of capital expenditures for new school buildings in the system, over a two-year period, showed that the capital construction costs for new schools tendered during 1967-68 and completed--or substantially completed--during the two-year period 1968 and 1969 amounted to \$13,012,966. This amount was the cost of the buildings alone. The additional costs of school furnishings and equipment, site work, landscaping, and sites acquisition brought the total amount to \$15,203,977. This figure does not include site development 50 feet beyond the buildings, the cost of which was assumed by another agency.

A breakdown of these capital costs follows, with cost comparisons using various unit bases of expenditure: per pupil, per teaching station, per square foot, and per cubic foot.

The building and equipment costs for 12 new schools constructed during the two-year period were summarized in Table XIV. The building cost figures (column two) comprised the architect's fees and the final contract price, less the cost of the immediate site work (50 feet adjacent to building), the portion of the architect's fees related to that site work (6 percent of the immediate site work cost), and the refunded federal sales tax on building materials. The cost of the buildings as indicated in the table may be said to be the cost of the



TABLE XIV  
NEW SCHOOL CONSTRUCTION COSTS  
1968 AND 1969

Type of School	(A) Cost of Bldg. (dollars)	(B) Cost of furnishings and equipment (dollars)	(A+B) Total cost
1. Elementary- Junior High	980,746	100,568	1,081,314
2. Junior High	931,311	96,551	1,027,862
3. Elementary	421,426	39,096	460,522
4. Elementary	563,897	52,036	615,933
5. Elementary- Junior High	958,728	108,967	1,067,695
6. Junior High	962,748	103,818	1,066,566
7. Elementary	434,168	36,677	470,845
8. Elementary	579,733	50,001	629,734
9. Vocational	1,607,316	251,504	1,858,820
10. Comp. High	4,294,599	500,000	4,794,599
11. Elementary	731,829	43,237	775,066
12. Elementary	546,465	39,596	586,061
TOTALS	13,012,966	1,422,051	14,435,017





"bare" building. Schools are ranked on the same basis in all of the tables--that is, building cost per square foot. This permits a continuing comparison of that standard with the other bases as they are introduced and a ready inter-comparison of the various bases as well.

Equipment and furnishings costs (column three of Table XIV) included costs of relatively mobile equipment and furnishings. Such items as "built-in" benches and cupboards are part of the original contract price and were not included here. Column four provides the total cost figures for a completely equipped and furnished school building, less site costs. In the school district under study, equipment costs together with building costs, were capitalized and amortized over twenty years.

Various data with respect to the twelve buildings studied are summarized in Table XV. The number of pupils for which the building was designed is given in column two. Some differences occurred between stated capacities and "actual" capacities as judged by the principals of the schools involved. Differences were particularly common in open-area schools. For example, in the schools ranked two, five, and six, all of which are open-area schools, the principals felt strongly that although the "theoretical" design capacity was set at 720 pupils, the "real" capacity at best would be 600. However, the school ranked 11 is also of the open-area type, and in this case the principal felt its superior design provided for at least the stated capacity, perhaps more. The difference seemed to lie in principals' and staffs' attitudes toward--and ability to work under--open-area conditions, rather than in building design itself. For example, the principal of the open-area junior high school ranked six commented that one area in the



TABLE XV  
NEW SCHOOLS (1968-69)

BUILDING DATA

Type of school	Pupils (design capacity)	Teaching Stations (design capacity)	Gross area (sq.ft.)	Gross volume (cu.ft.)
1. E & JH	720	33	74,350	-----
2. JH	720	33	70,487	-----
3. E	360	14	31,620	476,426
4. E	480	21	41,870	640,122
5. E & JH	720	33	70,487	-----
6. JH	720	33	70,487	-----
7. E	420	15	31,445	474,220
8. E	480	21	40,860	613,548
9. V	500	42	108,515	-----
10. CH	1,800	80	270,105	-----
11. E	600	23	45,792	691,838
12. E	420	15	32,233	484,632



school, designated as an open area with a capacity of 120 pupils, was too noisy if occupied by that number. He felt that 90 students was the limit, and even at that he needed a closed space as a "back-up" seminar room.

The number of teaching stations is given in column three of Table XV. This seemed to be the least reliable and, hence, least useful figure in describing school buildings. The "theoretical" design number as seen by architects and/or the provincial department of education, and the "actual" number as seen by principals tended to be widely divergent. Originally the concept was simple. The number of stations was merely the number of classrooms in the building. With the advent of large schools and open-area schools the definition became unrealistic. Large gymnasiums began to be designated as two-, three-, and four-station areas even though fewer than this number of classes could realistically be accommodated at one time. Large lecture-theatres were rated as three-, five-, or eight-station areas (reflecting the student capacity) despite the fact that only one teacher could "hold forth" therein at any one time.

Open-area schools presented a particular problem. Was the number of stations the "theoretical" design number, the "actual" number, or the "actual possible" number? Should study rooms which could be and occasionally were used as classrooms be so designated? What about "nooks" and corners which could be readily used as small "classrooms" for five to ten students?

In general, "theoretical" design capacities were used in this study. Where deemed necessary, some of these capacities, after





consultation with the principal, were altered to bring them more in line with reality. Libraries and lecture theatres were counted as one station. Small, independent-study areas or music practice rooms were excluded unless instruction regularly occurred in these areas. The figures in column three of Table XV thus approximate the actual situation in each school as judged by the principal. For the purposes of this study, then, a teaching station was defined as that area, closed or open, large or small, which was regularly used for instructional purposes.

This definition was easy to apply where one instructor was in charge of an area. Where two or more instructors were in charge of the same group, the number of stations was still designated as one unless the group was clearly subdivided and one or more instructors was "instructionally" in charge of the subdivided group on a regular basis. In the latter case, the number of stations equalled the number of subdivided groups. The evidence indicated repeatedly that the per-teaching-station unit was not a very meaningful unit for open-area schools.

Column four of Table XV provides gross floor-area figures including all closed-in instructional and noninstructional areas. The noninstructional areas included all storage rooms, shelter rooms, closets, washrooms, offices, corridors, and so on, together with the "floorspace" occupied by exterior and interior walls and partitions. Approximately 65 percent of the gross area was used for instructional purposes.

"Cubages," for elementary schools only, have been worked out in column five of Table XV. These figures are gross volumes in cubic feet. The cubage unit is analogous to square footage except that the former



accurately accounts for differential ceiling heights whereas the latter unit does not.

### Unit Cost of Buildings

Costs of school buildings are rank-ordered in Table XVI according to the cost per square foot, as they are in all of the tables in this section. The building costs per cubic foot, calculated for elementary schools only, appear in column five. These costs follow the rank-ordering of the square footage figures, but if the vocational and composite schools had been calculated, it is likely that the many high-ceiling areas in these schools would be reflected in higher-ranking per-cubic-foot cost figures. This was not determined in the study.

The square footage rank-ordering of the figures in Table XVI is deceptive. For example, the school ranked ten shows a "reasonable" square footage cost of \$15.90, but the cost per teaching station is an incredible \$53,682. This latter amount is nearly double the average cost per teaching station of the other schools, thus ranking it well above all the others. However, this also is illusory. The high cost per teaching station is a function of the definition of a station and the fact that a great deal of space at this school is devoted to independent study and unsupervised work/practice activities.

The schools ranked nine and ten (on the basis of square footage costs) in Table XVI would have their cost and cost relationship much more accurately revealed if displayed on a per design pupil basis as in column two. The high per pupil costs (\$3,215 and \$2,386, respectively) of schools nine and ten compare unfavorably with the average cost of about \$1,200 to \$1,300 for all schools.



TABLE XVI  
UNIT ANALYSES  
OF CONSTRUCTION COSTS OF NEW SCHOOLS  
1968-69

Type of school	Bldg.cost <sup>a</sup> per design pupil space (dollars)	Bldg.cost <sup>a</sup> per teaching station (dollars)	Bldg.cost <sup>a</sup> per sq.ft. (dollars)	Bldg.cost <sup>a</sup> per cu.ft. (dollars)
1. E & JH	1,362	29,720	13.19	-----
2. JH	1,293	28,222	13.21	-----
3. E	1,171	30,102	13.33	.88
4. E	1,175	26,852	13.47	.88
5. E & JH	1,332	29,052	13.60	-----
6. JH	1,337	29,174	13.66	-----
7. E	1,034	28,945	13.81	.90
8. E	1,208	27,606	14.19	.99
9. V	3,215	38,269	14.81	-----
10. CH	2,386	53,682	15.90	-----
11. E	1,220	31,819	15.98	1.06
12. E	1,301	36,431	16.95	1.13

<sup>a</sup> Based on the cost of the "bare" building as given in column A of Table XIV.





Yet square footage costs continue to receive inordinate attention at school board meetings and elsewhere. This was so in the case of the school ranked 12 which was, at \$16.95/sq.ft., "the most expensive school built in two years." That it should be so "expensive" seems incredible when note is taken of the fact that it is an elementary school and that it was being compared with a vocational and a composite high school. Since the limit of support for elementary schools under provincial regulations was \$16.00/sq.ft., the school district not only had to meet the cost of the extra 95 cents per square foot (\$30,622), but had to pay for site work, landscaping, and school equipment as well (\$59,978). These latter costs would only have been supported if the building cost had been under \$16.00/sq.ft. Yet the cost per pupil of this elementary school was a "reasonable" \$1,301 (which would rank it fifth in unit cost instead of twelfth).

#### Cost of Land

Only the costs of school buildings and their contents have been examined thus far. A more complete picture of the expenditures involved in establishing a new school was provided by the inclusion of cost data for the school grounds.

It is sometimes argued that land is permanent and that its unit cost approaches zero as time approaches infinity. However, because school districts are usually dealing with much shorter times than eternity, it is worth noting the effect that land costs have on school costs. Column two of Table XVII gives the cost of site acquisition. These figures are illustrative of the fact that the amount "dedicated" for the public schools (5.25 percent of the land involved in a re-plot) was



TABLE XVII  
COST OF GROUNDS FOR  
NEW SCHOOLS: 1968-69

Type of school	Site acquisition cost <sup>a</sup> (dollars)	True market value <sup>b</sup> of site (dollars)	Immediate Site work, related fees, and landscaping (dollars)	Total cost of site (dollars)
1. E	62,251	240,000	18,445	80,696
2. JH	35,501	225,000	19,231	54,732
3. E	29,126	115,500	16,599	45,725
4. E	1	202,500	15,723	15,724
5. E & JH	1	184,500	13,787	13,788
6. JH	67,683	157,500	11,085	78,768
7. E	1	138,000	21,367	21,368
8. E	45,450	136,500	13,419	58,869
9. V	143,450	214,500	46,920	190,370
10. CH	24,203	292,500	94,660	118,863
11. E	54,600	136,500	15,074	69,674
12. E	1	141,000	20,382	20,383
Totals	462,268	2,184,000	306,692	768,960

<sup>a</sup> Actual cost figures are used here, irrespective of the year of purchase or whether traded for another plot of land; all sites (except those ranked eight, nine and eleven) include a "dedicated" portion purchased from the city for a token one dollar; all of sites ranked 4,5,7 and 12 were so "dedicated."

<sup>b</sup> Estimated on the basis of the average cost/acre of similar land plots in 1968-69.



seldom adequate and extra land usually had to be purchased. While the provincial authority assisted greatly with building costs, all land costs remained the sole responsibility of the school district.

Column three of Table XVII provides an indication of the true market value of the land. In all cases the market value was considerably above the actual cost to the school district. However, the "saving" to taxpayers may well be more apparent than real. It could be argued that low-cost or "free" land has its hidden costs to the community in that the cost of each acre of "dedicated" or low-cost land must be reflected in a higher cost for the rest of the land in the re-plot. The "effective" cost of school land to the community was probably higher than if no dedications were made and all land were purchased. This is because home and other property owners in the area were "covering" the costs of dedicated land in their private mortgages at higher interest rates than those normally obtainable by this urban school district.

Displayed in column four of Table XVII were costs of site work, related architect's fees (six percent of the cost of the site work), and landscaping, for the immediate site within 50 feet of the building. The remainder of the school site was developed by another agency. The high costs of immediate site work for the schools ranked nine and ten in Table XVII reflected the substantial cost of large paved areas for parking and access lanes needed by these large schools.

#### Total Costs on a Unit Basis

Table XVIII provides some comparisons of total unit costs for the twelve schools. All costs of building, equipment, site work, and land acquisition were included for purposes of these comparisons. Columns





TABLE XVIII  
UNIT ANALYSES OF TOTAL  
CAPITAL COSTS OF 12 NEW SCHOOLS  
1968-69

Type of school	Total cost <sup>a</sup> per design pupil space (dollars)	Total cost <sup>a</sup> per sq.ft. of building (dollars)	Average annual cost <sup>b</sup> per pupil over 20 years (dollars)	Average annual cost <sup>b</sup> per sq.ft. over 20 years (dollars)
1. E & JH	1,614	15.67	144	1.40
2. JH	1,504	15.36	134	1.38
3. E	1,406	16.00	125	1.43
4. E	1,316	15.08	117	1.34
5. E & JH	1,502	15.37	134	1.37
6. JH	1,589	16.26	142	1.45
7. E	1,172	16.10	105	1.39
8. E	1,434	16.80	128	1.50
9. V	4,098	18.50	366	1.65
10. CH	2,730	18.20	244	1.62
11. E	1,408	18.44	126	1.65
12. E	1,444	18.80	129	1.68

<sup>a</sup>Based on Table XIV and XVII and includes the total costs of land, building and equipment.

<sup>b</sup>Includes interest at 7½ percent on the total costs amortized over 20 years, a reflection of the actual situation. Per pupil refers to per designed pupil space as in column two; per square foot refers to per square foot of building as in column three.



four and five include interest on the capital amount amortized over twenty years. These average annual cost figures may be halved to give the costs for a 40-year period. Average annual costs per design pupil space were approximately \$120 to \$140 for elementary and junior high schools, about \$240 for composite high schools, and about \$370 for vocational schools, when the principal amount was amortized over 20 years. Again, the cost per square foot unit does not illustrate this cost differential. The per pupil unit appears to be the most meaningful measure of cost.

Some figures, additional to those in Table XVIII, were calculated in order to take into account the discrepancy between "design" pupil figures and "actual" number of pupils. Some minimum-maximum annual average (over 20 years) costs per pupil were determined for the schools ranked five, six, and nine in Table XVIII. The minimum cost was based on the principal's estimate of "actual" maximum school capacity, while the maximum was based on current enrolments (which were less than the capacity figures). These minimum-maximum per pupil figures follow, with the corresponding "design" figure from column four of Table XVIII given in brackets for comparative purposes:

School No. 5	Elementary-Junior High	\$161/175	(\$134)
School No. 6	Junior High	\$170/204	(\$142)
School No. 9	Vocational	\$408/484	(\$366)

In all cases, both the minimum and maximum cost figures were well above the "design" figures. These schools were selected for this additional comparison because the "design" figures, as noted previously, were judged by their principals as unrealistic, a problem associated with the development of the open-area concept.



As an example of the distorting effect obtained through use of the square foot as a cost unit, it can be seen from column five of Table XVIII that the range of costs on a per square foot basis was from \$1.34 to \$1.68 (average annual cost per square foot over 20 years). This is a very small differential when compared with the range from column four on a per pupil basis of \$105 to \$366 (average annual cost per pupil over 20 years). Furthermore, the "least expensive" and "most expensive" schools on a per square foot basis were both elementary schools (ranked one and twelve in all tables). When these same two schools are compared on a per pupil basis, their costs are relatively close (\$117 and \$129, average annual cost per pupil over 20 years), but are far below the highest ranking school (\$366) and the next highest ranking school (\$244). The lowest ranking school on a per pupil basis was an elementary school, at \$105 per pupil. The latter school ranked seventh out of twelve on the basis of the per square foot unit of cost.





## CHAPTER VI

### SUMMARY OF FINDINGS, CONCLUSIONS, IMPLICATIONS, SUGGESTIONS FOR FURTHER RESEARCH

#### I. INTRODUCTION

This study took on significance in the light of the urban project of which it was a part, and in the light of the whole Alberta series of studies. See Duke (1970:11-13) for a general overview of the significance of the project.

In addition, this study had individual significance in that it attempted to determine total implementary costs, including not only the usual operating expenditures but debt service and capital out of current revenue as well. The latter expenditures have been neglected in general in previous determinations of unit cost, even though they represent a significant expenditure (in the public eye, if not statistically). This study thus made possible a more realistic total cost per pupil figure. The development of a functional cost structure for the study provided for display of these per pupil costs in a more meaningful way for many publics.

This study also examined capital expenditures for new school buildings. The examination revealed the relatively high cost per pupil of capital expenditure for selected schools, when compared with debt service per pupil costs in current expenditures. In addition, it revealed the inadequacy of the square foot basis for comparing costs of school buildings.



## II. EXPENDITURES OUT OF CURRENT

### REVENUE

Figure 7, at the end of Chapter V, aggregated and displayed information in the manner originally proposed, and Table XIX in this section reviews that information. It would appear that the collection and display of information in such a manner, although clear and meaningful, may relate more to the research structure and division of labor for the urban project than to functional expenditure categories. Upon re-examination, the Support Services categories of special education, audio-visual and library, and instructional implementary would appear to relate much more directly to the Instructional function than to the Support Services function. Special education is not really a support service at all, but is in fact involved with the direct instruction of students, albeit special students. The audio-visual and library expenses relate to instruction in much the same way as do textbooks and these of course are charged to the instruction function. The sub-function, instructional implementary costs, might more aptly be termed instructional "overhead," as the bulk of these expenditures related to such items as substitute teachers, teacher-interns, educational leave, instructional improvement, and miscellaneous instructional supplies. These expenditures can, and should, be related directly to the instructional salaries of the regular classroom teachers as they are directly chargeable to the maintenance of that teaching force on staff and to the improvement of instruction.

Therefore, to summarize these costs in a simpler and more meaningful structure, expenditures were re-allocated in Table XX under



TABLE XIX  
SUMMARY OF TOTAL INSTRUCTIONAL & IMPLEMENTARY EXPENDITURES  
BY FUNCTIONAL CATEGORIES

	Expenditure	% of Grand Total Expenditure	Expenditure Per System Pupil
<u>INSTRUCTIONAL</u>			
Direct & Indirect Instruction	\$34,315,258	58.1	\$471.47
<u>IMPLEMENTARY</u>			
SUPPORT SERVICES			
Instructional Implement.	1,170,447	2.0	16.08
Special Education	781,268	1.3	10.73
AV & Library	2,832,014	4.8	38.91
Guidance & Psych.	1,881,968	3.2	25.86
Pupil Transportation	874,584	1.5	12.02
TOTAL, SUPPORT SERVICES	7,540,281	12.8	103.60
ADMINISTRATION			
C.O. Administration	2,663,038	4.5	36.59
PHYSICAL PLANT			
Maintenance	2,126,059	3.6	29.21
Operation	4,324,429	7.3	59.41
Debt Service	7,211,531	12.2	99.08
Capital from Current Revenue	895,892	1.5	12.31
TOTAL, PHYSICAL PLANT	14,557,911	24.6	200.01
GRAND TOTAL	59,076,488	100.0	811.67





TABLE XX  
SUMMARY OF TOTAL EDUCATIONAL EXPENDITURES  
BY REVISED FUNCTIONAL CATEGORIES

	<u>Expenditure</u>	<u>% of Total</u>	<u>Per System Pupil</u>
A. INSTRUCTION			
1. Direct & Indirect Instruction	\$34,315,258	58.1%	\$471.47
2. AV & Library	2,832,014	4.8%	38.91
3. Instructional Overhead	1,170,447	2.0%	16.08
4. Special Education	781,268	1.3%	10.73
B. PHYSICAL PLANT			
1. Debt Service	7,211,531	12.2%	99.08
2. Operation	4,324,429	7.3%	59.41
3. Maintenance	2,126,059	3.6%	29.21
4. Capital out of Current Revenue	895,892	1.5%	12.31
C. SUPPORT SERVICES			
1. C. O. Administration	2,663,031	4.5%	36.59
2. Guidance & Psych.	1,881,968	3.2%	25.86
3. Pupil Transportation	874,584	1.5%	12.02
TOTAL	\$59,076,488	100.0%	\$811.67



three broad functions: Instruction, Physical plant, and Support services, rank-ordered according to the magnitude of the total expenditures for each function. In addition, Table XX rank-ordered the sub-functions under each of the three broad functions designated.

The Instructional function consists of the sub-functions (in rank order of magnitude): Direct and Indirect Instruction, Audio-visual and Library Services, Instructional Overhead, and Special Education. A large number of sub-functions could be developed for Direct and Indirect Instruction, but this was handled by the other researchers in the urban study, and so were omitted here.

The Physical Plant function includes the sub-functions (in rank order): Debt Service, Operation, Maintenance, and Capital Out of Current Revenue.

The Support Services function contains the following sub-functions (also rank ordered): Central Office Administration, Guidance and Psychological Services, and Pupil Transportation. Note that Central Office Administration expenditures have lost their status here as a separate function, and were included as one of the support services.

Figure 8 aggregates and diagrams the sub-function data developed in Table XX, and provides a complete summary of current expenditures for the 1969-70 school year in the urban system under study.

Total educational costs were \$59,076,488 or \$811.67 per system pupil. Three broad functions comprised the total expenditure: Instructional costs, 66.2% of the total, were \$39,098,987 or \$537.19 per system pupil; Physical Plant costs, 24.6% of the total, were \$14,557,911 or \$200.01 per system pupil; and Support Services costs, 9.2% of the total,



Total Educational Costs - 100% of Total  
 Aggregate: \$59,076,488  
 Per System Pupil: \$811.67

A. Instructional Costs - 66.2%  
 Aggregate: \$39,098,987  
 Per System Pupil: \$537.19

B. Phys. Plant Costs - 24.6%  
 Aggregate: \$14,557,911  
 Per System Pupil: \$200.01

C. Support Services - 9.2%  
 Aggregate: \$5,419,590  
 Per System Pupil: \$74.47

1. Direct & Indirect Instruction - 58.1% of Total  
 Aggregate: \$34,315,258  
 Per System Pupil: \$471.47
  2. AV & Library - 4.8% of Total  
 Aggregate: \$2,832,014  
 Per System Pupil: \$38.91
  3. Instructional Overhead - 2.0% of Total  
 Aggregate: \$1,170,447  
 Per System Pupil: \$16.08
  4. Special Ed.<sup>a</sup> - 1.3% of Total  
 Aggregate: \$781,268  
 Per System Pupil: \$10.73
- 
1. Debt Serv. - 12.2% of Total  
 Aggregate: \$7,211,531  
 Per System Pupil: \$99.08
  2. Operation - 7.3% of Total  
 Aggregate: \$4,324,429  
 Per System Pupil: \$59.41
  3. Maintenance - 3.6% of Total  
 Aggregate: \$2,126,059  
 Per System Pupil: \$29.21
  4. Capital out of Current Revenue - 1.5% of Total  
 Aggregate: \$895,892  
 Per System Pupil: \$12.31
- 
1. C.O. Administration - 4.5% of Total  
 Aggregate: \$2,663,038  
 Per System Pupil: \$36.59
  2. Guidance & Psych. - 3.2% of Total  
 Aggregate: \$1,881,968  
 Per System Pupil: \$25.86
  3. Pupil Transportation - 1.5% of Total  
 Aggregate: \$874,584  
 Per System Pupil: \$12.02

<sup>a</sup>Includes "additional" costs only: expenditures for instruction and special equipment over and above the costs that would have been incurred had the special education students been regular students.

FIGURE 8

REVISED FUNCTIONAL SUMMARY OF TOTAL  
 EDUCATIONAL EXPENDITURES





were \$5,419,590 or \$74.47 per system pupil.

The sub-functions and associated costs are listed in Figure 8 under the three broad functions designated, in declining order of magnitude.

It would appear that the functional display of cost data on a per pupil basis provides a most meaningful way of conveying information to parents, taxpayers, school trustees, teachers, administrators, and businessmen.

### III. CAPITAL EXPENDITURES

Gross square footage has become the standard measure in the construction trade and, variously defined, is used in discussions with school boards and departments of education. This appears reasonable so long as educational activities and objectives in relation to a particular space are being discussed. However, when this unit is used to establish average cost-per-square-foot figures and these figures in turn are used as the basis for decision-making, serious distortions occur. These distortions are too often ignored or overlooked. See Table XVIII.

This section of the study demonstrated that building costs per pupil constitute the best unit of measure to relate cost to the purpose for which the building was constructed. This unit needs to be tempered by more experience with the open-area type of school, but at present it seems to most accurately indicate the cost of schools.

The evidence gathered in this section of this study indicated that educational administrators should now begin the task of pointing out to school boards, provincial authorities, and others, the fact that pupils, not square feet, are being educated in school buildings.



#### IV. FURTHER RESEARCH

The major area requiring further research is that of the relationship between capital expenditures and current operating expenditures. Although debt service expenditures are a fairly reliable indicator of this relationship over the long term, they react very slowly to dramatic changes in capital expenditures and do not readily permit costing of particular schools. The examination of capital expenditure herein would seem to indicate that a much higher percentage of the operating expenditures than the debt services indicator would show (12.2%) are currently going towards the construction of new buildings. The relative magnitude of these apparently significant capital expenditures was not determined in this study.

In addition, analyses should be done to determine the per client costs of some support services, such as guidance and psychological services, additional special education services, and pupil transportation.

An overriding concern is that of cost-benefit, cost-effectiveness, or cost-utility of functional areas. Such analyses were not addressed in the study, but are ultimately required if maximum use is to be made of the cost analysis data.



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